CLASSICAL INDIAN PHILOSOPHY OF INDUCTION

THE NYĀYA VIEWPOINT

KISOR KUMAR CHAKRABARTI

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This work is dedicated to Udayana (eleventh century CE),
my favorite philosopher, who is also a great philosopher.

Contents

Abbreviations

ATV	Udayana, *Ātmatattvaviveka,* ed. Dhundiraja Sastri, Kashi Sanskrit Series 84, Chowkhamba, Benares, 1940
Bois	being other than the inferential subject
BP	Visvanatha, *Bhāṣāpariccheda,* with six commentaries, ed. C. S. R. Sastry, Sri Balamorama Press, Madras, 1923
BPP	Visvanatha, *Bhāṣāpariccheda,* with *Mūktāvalīsamgraha*, ed. Pancanana Sastri, Sanskrit Pustak Bhandar, Calcutta, 1984
CR	counterfactual (subjunctive) reasoning
DHM	Dharmottara
DI	K. Chakrabarti, *Definition and Induction*, University of Hawaii Press, Honolulu, Hawaii, 1995
Disni	not being either the inferential subject or a negative instance
DK	Dharmakirti
DM	Durveka Misra
DR	Dharmarajadvarin
FFF	Nelson Goodman, *Fact, Fiction and Forecast*, Harvard University Press, Cambridge, Massachusetts, fourth edition, 1983
GAIE	general acceptability of inductive examples (principle of)
GD	Gadadhara, *Gādādharī*, I and II, second edition, ed. V. P. Dvivedi et al., Chowkhamba, Benares, 1970
GR	Stalker, Douglas, ed., *Grue!*, Open Court, Chicago, 1994
HB	Dharmakirti, *Hetubindu*, with the commentary of Arcata, ed. Sukhlal Sanghvi, Oriental Institute, Baroda, 1949
HP	Colin Howson, *Hume's Problem*, Clarendon Press, Oxford, 2000
JD	Jagadisa Tarkalamkara, *Jāgadīśī*, ed. Somanathopadhyaya, Vol. I, Chowkhamba Sanskrit Series No. 29, Chowkhamba, Benares, 1983
JI	R. Swinburne, ed., *The Justification of Induction*, Oxford University Press, Oxford, 1974

KKK	Sriharsa, *Khaṇḍanakhaṇḍakhādya*, Kashi Sanskrit Series No. 197, Chowkhamba, Benares, 1970
LFP	R. Carnap, *Logical Foundations of Probability*, University of Chicago Press, Chicago, 1950 (second edition, 1962)
MN	Mathuranatha Tarkavagisa
NBD	Dharmakirti, *Nyāyabindu*, with *Tika* and *Pradīpa*, ed. D. Malvania, K. P. Jayswal Research Institute, Patna, 1955
NK	Udayana, *Nyāyakusumāñjali*, with *Nyāyabodhanī*, *Prakāśa*, *Prakāśikā* and *Makaranda*, Chowkhamba, Benares, 1935
NS	Gotama, *Nyāyasūtra* with *Bhāṣya* of Vatsyayana, eds. P. Sastri and H. Sukla, Kashi Sanskrit Series No. 43, Chowkhamba, Benares, 1942
NV	Uddyotakara, *Nyāyavārttika*, eds. V. P. Dvivedi and L. S. Dravida, Chowkhamba, Benaras, 1915
OC	observational credibility (principle of)
Phillips	Stephen Phillips and N. S. Ramanuja Tatacharya, *Gangesa on the Upādhi*, Indian Council of Philosophical Research, New Delhi, 2002
PKM	Prabhacandra, *Prameyakamalamārtaṇda*, ed. M. K. Sastri, Nirayna Sagar Press, Bombay, 1941
PST	R. von Mises, *Probability, Statistics and Truth*, second edition, New York, Dover, 1957
PV	Dharmakirti, *Parmāṇavārttika*, with *Vrtti*, ed. Dvarikadas Sastri, Bauddha Bharati, Benares, 1968
RD	Gangesa, *Tattvacintāmaṇi*, with *Prakāśa* and *Tarkacūdāmaṇi*, vol. II, part I, ed. N. S. Ramanuja Tatacarya, Kendriya Sanskrit Vidyapeetha, Tirupati, 1982
RM	Rucidatta Misra
RS	Raghunatha Siromani
SL	Gangesa, *Siddhāntalakṣaṇa*, with *Dīdhiti*, *Jāgadīśī*, et al., second edition, ed. G. P. Sastri, V. V. Prakashan, Benares
TC	Gangesa, *Tattvacintāmaṇi* with *Māthurī*, ed. K. N. Tarkavagisa, Motilal Banarasidass, Delhi, 1974
TCDP	Bhavananda Siddhantavagisa, *Tattvacintāmaṇi-Dīdhiti-Prakāśa*, ed. Mahamahopadhyaya Kalipada Tarkacharya, Vols. I and II, Bibliotheca India Series No. 194, Asiatic Society, Kolkata (Calcutta)
TPS	Jayarasi, *Tattvopaplavasimha*, Gaekwad's Oriental Series, Baroda, 1930
TR	Varadaraja, *Tārkikarakṣā*, *The Pandit*, Arthur Venis, Benares, 1903
TRP	J. M. Keynes, *A Treatise on Probability*, Macmillan, London, 1948
TS	Annambhatta, *Tarkasamgraha*, with *Dīpikā*, translation and elucidation by Gopinath Bhattacharya, Progressive Publishers, Calcutta, 1976
TT	Vacaspati Misra, *Nyāyavārttikatātparyatīkā*, ed. R. S. Dravida, Kashi Sanskrit Series No. 24, Chowkhamba, Benares, 1925
TTD	Vyasatirtha, *Tarkatāṇḍavam*, ed. V. V. Madhavachar, University of Mysore Sanskrit Series No. 82, Vol. IV, 1948

Preface

The problem of induction has drawn much attention since David Hume introduced it in modern times and remains a hotly debated issue in contemporary philosophy. However, long before the modern era, Indian philosophical schools addressed this problem for about two thousand years and the Sanskrit philosophical literature on this subject is extensive. We have tried to give a glimpse of this age-old debate. In the first chapter we briefly state and examine a number of major Indian viewpoints, including those of Udayana (eleventh century CE), Jayarasi (seventh century CE), Prabhakara (eighth century CE), Dharmakirti (seventh century CE) and Prabhacandra (fourteenth century CE). We also briefly discuss some major contemporary viewpoints (including those of Russell, Strawson, Reichenbach, Popper, Carnap and so on) on this problem and include a discussion of the grue paradox, often called the new riddle of induction. (It is remarkable that Gangesa and others not only discussed the classical problem of induction but also anticipated the "new" problem of induction not found in Hume.) The main focus is on the Nyāya view, particularly the later Nyāya view as developed by Gangesa (thirteenth century CE). Induction is a basic method of scientific and philosophical inquiry. Against the skeptical tide we have tried to show that the method is secure and reliable.

We discuss the Nyāya view from a historical and comparative perspective and bring out its relevance for contemporary philosophy. Without any doubt the Nyāya view is highly developed and defensible and we have tried to show that, but whether it is the most defensible view requires further study and is beyond the scope of this work. However, it is our hope that the work shows that contemporary philosophers would profit if they engage seriously with older Indian views with an open mind. The six Nyāya chapters (chapters 3–8)

are for specialists of Indian philosophy, though other patient readers should also find a great deal of advanced, innovative, off the beaten track and rigorous philosophy in them. While responding to the skeptical critique of induction, the Nyāya has provided a powerful argument from counterfactual reasoning (CR), clear arguments for defense of causality (such as the argument from the occasional nature of an effect and rejection of plurality of causes), an advanced analysis of the flaw of circularity and logical economy, rigorous arguments for objective universals and a formidable argument from belief-behavior contradiction. A skeptic who seeks to join issue with the Nyāya case for induction should critically examine these Nyāya arguments explained and developed in the second chapter. Modern European empiricism failed to make more progress because some of these arguments remained underdeveloped and underutilized. Another reason for such lack of progress is insufficient recognition of some basic principles, viz., the principle of observational credibility (OC), the principle of general acceptability of inductive examples (GAIE, discussed in my *Classical Indian Philosophy of Mind*) and the flaw of uniqueness (*asādhāraṇya*). There are no philosophical positions, including those of the Nyāya, that are above criticism and beyond challenge. Still, we can make progress, and a more advanced empiricism could emerge from a cross-cultural and comparative study of European and Indian empiricism.

It is worth noting as a historical point that while Hume may have found the problem of induction on his own, the possibility that he had some knowledge of the existence of the problem in the Indian tradition cannot be ruled out. He was at the Royal College of La Fleche in France in 1735–1737 when he wrote the *Treatise*. During that time he came into contact with Charles Francois Dolu, a Jesuit missionary, who lived there from 1723 to 1740. Dolu was respected for his scholarly achievements including extensive knowledge of Eastern religions and scientific views. He got firsthand knowledge of Therevada Buddhism in Siam in 1687–1688, was in India from 1688 to 1710 and carefully studied Buddhism including Tibetan Buddhism. He had direct contact with Ippolito Desideri, another Jesuit missionary, who visited Tibet and diligently studied Buddhism. Since the Buddhist no-self theory and the Carvaka critique of induction are age-old views very widely known in India and routinely included in Buddhist and Hindu texts, it is probable that Dolu studied them. It is also probable that someone as gifted as Hume could easily see the importance of those views from his conversation with Dolu and incorporated them into his philosophy. Hume's views about the self and induction are not linked to earlier Western views. At the same time, one may not readily give full credit of originality to two or more thinkers if there is significant evidence of contact. Though the evidence falls short of complete certainty, it appears to be significant enough to warrant the tentative assumption that Hume was indebted to Indian philosophical doctrines

for his famous views about the self and induction. (For data about Hume's Jesuit connection, I am indebted to Alison Gopnik's "Could Hume have known about Buddhism?" presented at the American Philosophical Association Pacific Division meeting, April 2009.)

Chapters 3–6 contain annotated translations of selected chapters from Gangesa's *Tattvacintāmaṇi* dealing with the problem of induction and related issues. While explaining and discussing Gangesa's view, we have added numerous references to the commentaries called the *Māthurī* of Mathuranatha Tarkavagisa (sixteenth century CE) and the *Dīdhiti* of Raghunatha Siromani (fifteenth century CE) as well as the supercommentaries called the *Jāgadīśī* of Jagadisa Tarkalamkara (seventeenth century CE) and the *Gādādharī* of Gadadhara Bhattacarya (seventeenth century). These writings are extremely difficult and technical and require many years of devoted study under the guidance of specialist pundits for proper understanding. This may be partly why not much has been unearthed by modern scholarship from these later Nyāya philosophers, whose writings nevertheless display exceptional brilliance and rigor. We hope that even this brief exposure to these later Nyāya philosophers may generate more interest in their works. Although the scope of these Nyāya chapters is limited, they would give a glimpse of the truly magnificent Nyāya philosophy that can only have a pride of place in perennial world philosophy. The seventh chapter is an annotated translation of selected passages on the problem of induction from the skeptical work called *Khaṇḍana-khaṇḍa-khādya* of Sriharsa (twelfth century CE), who belonged to the Vedānta school. The eighth chapter is an annotated translation of selected passages from the *Prameya-kamala-mārtaṇḍa* of Prabhacandra, who belonged to the Jaina school. The ninth and the final chapter is an annotated translation of selected passages from the *Nyāyabindu* of Dharmakirti, who belonged to the Buddhist school. The last two chapters should be of special interest to scholars of Jainism and Buddhism though they should also be useful for philosophers as well as scholars of Asian thought in general.

Finally, I have omitted diacritical marks from names of Indian philosophers. The pundits who have taught me tirelessly with inexhaustible knowledge and patience do not approve of use of diacritical marks for their names or names of other Indian philosophers. Out of respect for them who are true descendents of ancient Indian philosophers, I have omitted these marks from the names.

**Please note that the page references within chapters 3–6 are to TC of Gangesa, volume II, part I, with *Rahasya*, edited by K. Tarkavagisa, Chaukhamba Sanskrit Pratishthan, Delhi, 1990.

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The Problem of Induction: East and West

The problem of induction, a major philosophical issue, is the problem to justify the claim about our knowledge of unobserved cases from our knowledge of observed cases. In other words, the question is: can our experience of past and present particular instances make our generalized claims about all instances including past, present and future unobserved instances reasonable, reliable and acceptable? For example, when we observe in some cases that smoke is produced by fire and never observe a case where smoke is produced without fire, we may generalize that wherever there is smoke, there is fire. Such induction includes a claim about all smokes—past, present and future—that they are produced by fire though only a limited number of actual cases have been and can possibly be observed. Do we then have the right to claim that smoke is always produced by fire? In other words, can our observation of co-presence of smoke and fire in some cases make it reasonable, reliable and acceptable that smoke never exists without fire? Some philosophers have answered the question in the negative. We would like to see why. One thing is clear—not only philosophical investigation but also a great deal of science depends on induction. Scientists seek to discover laws of nature. Such laws as that heat expands bodies are inductions from observed to unobserved cases. A negative answer to the question above not only raises questions about legitimacy of significant parts of philosophical activity but also about much of science. No wonder then that the problem of induction has attracted a lot of attention in recent philosophy. It may be noted that the word induction is sometimes used in a broader sense to include virtually any nondeductive reasoning; but we use it in the basic sense of generalizing from particulars to the universal.

The problem of induction is old and has a long history. We first look at the problem as it developed in Indian philosophy. In Indian philosophy the problem arose in the context of examining the status of a kind of inference as a source of knowledge. The view that a paradigmatic kind of inference is not a source of knowledge (and by extension that no kind of indirect awareness is a source of knowledge) was forcefully presented by philosophers of the Carvaka school, many of whom held that perception or observation of particulars is the only source of knowledge. This is not to say that no Carvaka philosopher ever accepted anything other than perception as a source of knowing. On the contrary, there is evidence that some Carvaka philosophers granted the status of knowledge to certain cases of inference as well as testimony (while there were others who denied the status of knowledge to even perception). Still, for our present purposes, we limit ourselves to only those who accepted only perception as a source of knowing. Unfortunately, however, the writings of Carvaka (sixth century BCE?) and his principal followers are lost (except for Jayarasi, to whom we turn later). But, fortunately, the Carvaka viewpoint has been preserved by their philosophical opponents, including the Nyāya philosophers. [It is common in the Sanskrit philosophical tradition to state rival views clearly and precisely. The rival view is called "the predecessor's view/the preceding view/the objector's view" (*pūrva-pakṣa*) and sometimes even contains improvements on the original. The favored view is called "the successor's view/the succeeding view/the later view/the answering view/the accepted view" (*uttara-pakṣa*).] We look at the great Nyāya philosopher Udayana for an account of the Carvaka position. Like other Sanskrit philosophers, Udayana (eleventh century) writes in a compact style; hence some explaining has become necessary.

> Carvaka says: That which cannot be perceived does not exist. The opposite exists. God, etc., are not so; therefore, it should better be held that these do not exist. It may be objected that inference, etc., will then be eliminated. But this is not unwelcome.
>
> Objection: But then common activities would be impossible. Reply: No. That can be carried out on the basis of expectation (*sambhāvanā*) alone. Coherence is mistakenly thought to justify the claim of knowledge. (NK 334)

In the Carvaka view, if something cannot be perceived by anyone at any time whatsoever, then, since perception is the only source of knowledge, it cannot be admitted to exist. Since God and so forth are imperceptible, it is better not to admit that they exist. Only what is perceived exists (not that all that is perceived exists). Since it is unnecessary to admit existence of anything imperceptible, it is also unnecessary to accept inference (or any other

indirect means) as a source of knowledge. Is not inference indispensable even for common activities, such as searching for fire after seeing smoke? The reply is: no. It is indeed necessary to go beyond what is perceived at a given time and form opinions about the past as well as expectations about the future. All such activities can be fully explained in terms of such expectations. For example, one searches for unperceived fire after seeing smoke based on expectation that there is fire. It is both unnecessary and unjustified to claim that there is inferred knowledge of fire in such cases. When fire is actually found, does not that justify, because of the coherence (*samvāda*) between what was previously expected and what is now perceived, that there is knowledge of fire, so that acceptance of inference as a source of knowledge is necessary? The reply is: no. Success of action prompted by expectation does not turn expectation into knowledge. But such success and coherence suffice to generate confidence in expectations and make them appear as knowledge. "Appearing as knowledge" is all that is needed to account for such activities.

Rucidatta, who wrote the *Prakāśa* commentary on the *Nyāyakusumāñjali*, has described expectation as a doubt one side (*koti*) of which is stronger (*utkata*) than others (NK 334). If each side of expectation is equally matched, expectation would not lead to any action. But if one side is stronger than the others, expectation may lead to action. For example, when one sees smoke, one does not have any rational grounds for being sure that there is fire, but may nevertheless have a strong expectation that there is fire. This is a doubt with two sides, viz., that (1) there is fire and that (2) fire is not there. But the two sides are not equally matched; the first is stronger than the second, for fire has been observed together with smoke on many occasions. Hence it may very well lead to action of procuring fire.

The Carvaka philosopher argues further:

> Since there is no discriminating factor, how can it be known that although there is deviation in a certain case, there is no deviation in some other case? Thus, since there is no reason that can settle the matter one way or the other, the observation of togetherness itself is the ground of apprehension of deviation (*vyabhicāra*). How then can it be groundless? It may be said that there is deviation in some cases and not in some other cases due to the nature of things and that it is the nature of things which provides the discriminating factor. But by what signs can the nature of things be determined with certainty? This question should be considered carefully. For what is confirmed in hundreds of cases is also found to be refuted. It may be said that where no counterexample is known, there that is so [i.e., one has a proper reason for generalizing]. But from the fact that no counterexample has been found so far, who can legislate that none will be found anywhere at any time? (NK 339)

Several arguments are compressed in this passage. The Nyāya philosophers have accepted the observation of co-presence (*sahacāra-darśana*) as a method of generalization. It is pointed out first that the method cannot give any valid reason for making such a claim. Even when two things have been observed together in some cases, the one that is supposed to be pervaded is sometimes found to exist without the other (the supposed pervader). This establishes the fact of deviation and falsifies the general claim. Hence one cannot have any reason that this is not so in other cases when two things are observed together, for there is no objective ground for discriminating between the two situations, viz., (1) two things are together sometimes and separated sometimes, or (2) two things are together always. Accordingly, no generalization based on observation of co-presence can be justified. But then since there is no ground for generalizing, no such inferences can be sources of knowledge, for they all require at least one general premise that the probans is pervaded by the probandum. Since the premise is baseless, the inference is baseless too.

One may criticize the Carvaka position by saying that if inference is not accepted as a source of knowledge and if perception is the only source, the very apprehension of deviation will be groundless. The observed cases cannot provide the ground, for it is already known that the two things are together in each of these cases. In fact, if the so-called pervaded were found to be present without the so-called pervader in any of the known cases, the generalization would have been refuted and the apprehension replaced by the certainty that the generalization is false. Thus, the ground for the apprehension can come only with reference to the unobserved cases. But the unobserved cases are, *ex hypothesi*, beyond perception as well as knowledge. How could these then be the basis for such apprehension?

In reply, the Carvaka says that it is observation of togetherness itself that provides the ground of the apprehension. No inferential knowledge of unobserved cases is needed for apprehension of deviation. All that is required is the expectation that there are unobserved cases and that the two things may not be together in an unobserved case. The expectation can be based on observation of togetherness, for there are previous occasions when one of two things was observed without the other after both were observed together in many cases.

The Carvaka dismisses the suggestion that the ground of difference between cases of deviation and those of nondeviation may be found by an appeal to the nature of things. He argues that there are no signs with the help of which the nature of things could be determined with certainty.

The Carvaka also dismisses the suggestion that lack of knowledge of deviation could be the ground for knowledge of nondeviation. The *Prakāśa* says: "If nondeviation could be ascertained from lack of knowledge of deviation, deviation should be ascertainable from lack of knowledge of nondeviation" (NK 340).

Further, “If lack of knowledge of deviation were the ground for knowledge of pervasion, there would not be any doubt regarding pervasion when it is so [i.e., when there is lack of knowledge of deviation]” (NK 340). In other words, knowledge of pervasion is opposed to doubt about pervasion. If lack of knowledge of deviation could be the basis for knowledge of pervasion, there would not be any doubt regarding pervasion when there is lack of knowledge of deviation. Finally, the mere fact that no deviation has been noticed in the observed cases could give no reason that no deviation will be found at some other place in some other time, for even what is confirmed in hundreds of cases is found to be refuted by a single counterexample.

The Carvaka goes on to say: “Deviation and nondeviation follow respectively from presence and absence of adjuncts (*upādhi*); but the determination of that [i.e., determination of the absence of adjuncts] is impossible” (NK 339). To explain: Co-presence of two things or characteristics may depend on availability of adjuncts or additional third factors; if so, at least one of those two things/characteristics will be found without the other when the third factors are missing. For example, if one has observed every earthen vessel to be brittle and generalizes thereby that all earthen vessels are brittle, one overlooks that brittleness is not due to being earthen or being a vessel, but due to other factors, such as being built or baked in certain ways. In absence of those other factors, an earthen vessel will deviate from brittleness (i.e., an earthen vessel will not be brittle), and the generalization will be falsified. However, if co-presence of two things or characteristics is not dependent on any third factor, the Nyāya holds, they are nondeviant and the generalization that one of them is pervaded by the other is true. Thus one must carefully observe if any third factors are involved and “elimination of adjuncts” (*upādhi-nirāsa*) is a requisite step for generalizing. The Carvaka argues that while some third factors may be detected and eliminated, one cannot be sure that all third factors are eliminated. So, no empirical generalization is justified.

While an adjunct is anything that leads to deviation of the mark from the probandum, in the narrower, technical sense, it is defined as “that which pervades the probandum but does not pervade the mark” (NK 352). This definition may be explained with the help of the following stock example. While it is true that wherever there is smoke there is fire, it is not true that wherever there is fire there is smoke. This is because fire emits smoke only if the fuel is wet. Thus wet fuel (*ārdrendhana*) is the third factor on which co-presence of fire with smoke depends. The detection of the adjunct vitiates the generalization and also the inference of smoke from fire. In this inference smoke is the probandum and fire, the mark. The adjunct pervades the probandum (wherever there is smoke there is wet fuel), but the adjunct does not pervade the mark (fire may be found without wet fuel, as in an electric heater).

When the adjunct is defined in this way, it proves beyond all doubt that the mark deviates from the probandum. This may be explained as follows. Let *a*, *b*, and *c* stand respectively for the adjunct, the probandum and the mark. It is given that *a* pervades *b*. It follows that extension of *a* is equal to or greater than that of *b* and, therefore, that extension of *b* is equal to or less than that of *a*. It is given further that *a* does not pervade *c*. It follows that extension of *a* is neither equal to nor greater than that of *c*. It thus follows that extension of *b* is neither equal to nor greater than that of *c*. That is, since the intersection of *b* and the complement of *a* is empty and the intersection of *c* and the complement of *a* is non-empty, the intersection of *c* and the complement of *b* is non-empty. In the language of Nyāya: since the adjunct pervades the probandum and does not pervade the mark, the latter deviates from the probandum, for what deviates from the pervader of something also deviates from that thing (*vyāpaka-vyabhicāriṇah vyāpya-vyabhicāra-niyamāt*). [The formulation of such a law is a pointer incidentally to the fact that the Nyāya logic includes formal laws.]

Now an adjunct may be certain (*niścita*) or suspected (*sandigdha*: NK 351). It is certain when it is known that the adjunct pervades the probandum and does not pervade the mark. Such an adjunct proves beyond any doubt that the mark is deviant and hence it is so called. Wet fuel in the above example is an adjunct of this kind. On the other hand, if either the fact that the adjunct pervades the probandum or the fact that the adjunct does not pervade the mark (or both) is uncertain, the adjunct is subject to suspicion. A stock example of this kind of adjunct is the following (TC 319–20). One may infer after seeing that all the children of a woman are dark that the future child of the then-pregnant woman will also be dark. The inference involves the implicit general premise that all children of the woman are dark. But the general premise and the inference may be false, for the fact that all the children of the woman so far are dark may be due to some additional third factor, such as the dietary habit or the complexion of her male partner. If so and if the woman had changed her dietary habit or changed her male consort, the future child could very well be fair. Here the dietary habit is a suspected adjunct, for it is uncertain whether the dietary habit is an actual causal condition of the dark complexion of the children. Nevertheless, the possibility that such an adjunct is involved renders the general premise and the inference suspect. The Carvaka contends that elimination of all suspected adjuncts is impossible and that this alone suffices to make any empirical generalization baseless. This is particularly so because the Nyāya admits unobservable entities. What could be the ground for knowing that no unobservable adjunct is involved (NK 348)? [We do not know whether the argument from adjuncts was developed by a Carvaka philosopher or by Nyāya philosophers like Udayana while presenting the Carvaka stand-

point. There is no known Carvaka text in which the argument is found. While possibly the argument was first presented in a Carvaka work that is now lost, it is also possible that this crucial argument was developed by Nyāya philosophers themselves while working through the Carvaka viewpoint.]

Further, pervasion has been defined as a relation (between the probans and the probandum) that is not dependent on any adjuncts (*anaupādhika*). At the same time, an adjunct has been defined as that which pervades the probandum and does not pervade the mark. This shows that while "adjunct" appears in the definition of pervasion, "pervasion" appears in the definition of an adjunct—which is circular.

In the *Tattvacintāmaṇi* of Gangesa (thirteenth century) the Carvaka position has been succinctly stated as follows, making points similar to those of Udayana noted above:

> Inference is not a source of knowledge. Although perceptible adjuncts could be eliminated by verified non-apprehension, there will be apprehension of deviation stemming from imperceptible adjuncts. After all, two things that are together in hundreds of cases are found to be deviant. Common activities towards fire, etc., after seeing smoke, etc., are based on expectation, for coherence gives the appearance of knowledge. (TC 38–39)

Some other points are raised in the *Tattvacintāmaṇi* in the chapter titled "The Method of Generalization" (*Vyāptigrahopāyaprakaraṇam* 170–87). It is argued that multiple observations (*bhūyodarśana*) cannot be the method of generalization. Since each observation cannot singly provide the ground, their collection cannot provide the ground either. It could be said that impressions produced by the multiple observations provide the ground. But this is of no avail. Impressions could provide the ground for only what is contained in them. Since pervasion is not the content of any of them, they could not be the ground. (This is reminiscent of Hume's famous argument against causal power to the effect that causal power is not the content of either impressions or ideas.)

Further, multiple observations are not indispensable for generalization. In some cases a legitimate generalization can be made from a single observation. For example, let it be supposed that the particular color and the particular taste of a particular mango is not duplicated anywhere. Then, since there can be no counterexample under such circumstances, the generalization that whatever has that particular color has that particular taste is true, although based on a single observation. At the same time, a generalization supported by multiple observations could be false. For example, it is observed in hundreds of cases that something made of earth can be pierced by iron. Still the general statement that whatever is earthen is pierceable by iron is false: the diamond

is an earthen substance, but it cannot be pierced by iron. Thus, not only can sound generalizations be made without multiple observations, but also generalizations based on multiple observations can be false. This shows that multiple observations are not the proper ground for generalization.

It could be said that repeated observations are needed to dispel the fear that co-presence of two things in a single case is accidental (*kākatālīya*). But this is not acceptable in the long run, for the same apprehension could remain even after repeated observations. It could again be said that elimination of adjuncts should precede the generalization and that multiple observations are needed for that (since one has to find out if something does pervade the probandum and does not pervade the mark). Similar considerations could be offered for the elimination of any other third factors that do not qualify as adjuncts in the narrower sense, but that may be found to accompany the so-called pervader and the pervaded. But even if this were granted, imperceptible adjuncts and other imperceptible third factors could not still be eliminated in this way; therefore, the apprehension of deviation arising from the possibility of imperceptible adjuncts or other third factors would still remain. One could fall back on inference to eliminate imperceptible adjuncts or other third factors. But the inference would itself have to make use of a generalization. Since further justification would be needed for that and since the same issue would arise in each successive step, the process would surely lead to vicious infinite regress.

We at this point look at Jayarasi, the eighth-century Carvaka skeptic, who rejects all sources of knowledge, including perception. While dismissing a kind of inference as a source of knowledge, he raises the usual Carvaka objection that knowledge of pervasion (*avinābhāva-sambandha*) cannot be accounted for. He asks: is pervasion a relation between universals, or between universals and particulars, or between particulars (TPS 65)? The first and the second positions are with reference to the Nyāya claim that universals are eternal entities inherent in many particulars in spite of being different from and independent of them.[1] (This view has some distant similarity with the view of Aristotle who utilized universals to give foundation to our general knowledge claims about natural phenomena.) So far as Jayarasi is concerned, he summarily rejects both the first and the second positions by saying that he has shown elsewhere that universals cannot be admitted to exist. If the third position is advocated, since the particulars are infinite, pervasion as a relation among them, he says, could never be known. At any rate, sense experience cannot be the source of such knowledge so far as particulars belonging to distant times/spaces are concerned. (If sense-experience fails, so too will other sources of knowledge, for they are ultimately grounded on sense-experience and cannot extend our knowledge to what cannot be known through sense-experience.) One could, of course, enumerate the cases actually observed and

establish the relation of pervasion among them. But this cannot justify the "inductive leap" to all cases comprising the unobserved cases, past, present and future (TPS 65).

Regarding the Nyāya claim that pervasion could be justified as being based on causation, he asks: is a cloth determined to be the effect of the threads on the basis of its coming into being in succession or on the basis of its being cognized in succession (TPS 70)? The first view is not acceptable, for then other things coming into being simultaneously with the cloth would also be turned into effects. It could be replied that other things could be eliminated, because they are not related with the threads by way of agreement in presence (*anvaya*) and agreement in absence (*vyatireka*). But that cannot give the guarantee for causal connection, for things found to be co-present and co-absent may still not be causally connected. In fact, all that can be determined is whether two things have come into being at the same time or in succession. This falls short of proving causal connection. (Hume too makes a similar point in his critique of causation.) The second view, too, is not acceptable. Even two things that have come into being at the same time and are not related to each other as cause and effect may be cognized in succession, such as the two horns of a cow. Further, two nonentities (e.g., cowness and horseness—in the Carvaka view there are no universals like cowness) that are not causally related could also be cognized in succession. Thus being cognized in succession fails to justify a causal connection (TPS 71).

We now move on first to briefly consider some Indian responses to the problem of induction. We have looked at arguments intended to show that multiple observations cannot provide the adequate logical basis for generalization. If so, can that basis come from a single observation? Prabhakara, a great Mīmāmsā philosopher, has indeed favored the method of single observation (TC 177). Prabhakara points out that something could pervade something if and only if their co-presence is not dependent on any adjuncts. Thus pervasion is extensionally the same as the absence of adjuncts. In the Nyāya terminology, the absence of adjuncts is a qualifier of co-presence that is the substratum of the absence. Now, according to Prabhakara, an absence is ontologically reducible to its substratum; hence absence of adjuncts is reducible to nothing other than co-presence. Since co-presence can be known by a single observation, pervasion too can be known by a single observation (TC 178). Although pervasion can be grasped by a single observation, repeated observations are not wasteful. They confirm the generalization by eliminating the apprehension that additional third factors may be involved (TC 180).

But the method of single observation could fare no better, for the objections brought against multiple observations apply against single observation as well. In addition, if pervasion could be known by a single observation of co-pres-

ence, how could there be any apprehension of deviation (TC 179)? Since pervasion is already known once the pervader is observed together with the pervaded, and since such knowledge would remove the apprehension of deviation, the apprehension of deviation should disappear as soon as the co-presence is observed. Finally, even if it were granted that absence of adjuncts were ontologically the same as co-presence, it does not follow that knowledge of co-presence would necessarily include knowledge of absence of adjuncts. For example, Devadatta may be the son of Hemadatta, but one who sees Devadatta does not thereby automatically know that he is the son of Hemadatta. Hence, although mere co-presence can be known through a single observation, it does not follow that absence of adjuncts too can be known through a single observation (TC 183). Indeed, the latter knowledge involves that there are no third factors that pervade the probandum but do not pervade the mark. This goes far beyond the knowledge of co-presence alone.

If neither multiple observations nor a single observation suffices for the purpose, can pervasion be justified with the help of a kind of hypothetical reasoning called *ūha* or *tarka*? In fact, Jain logicians have promoted this view. They agree with the Carvakas that perception cannot be the means for knowing pervasion, for "only what is in contact (*sannihita*) with the sense organs can be known by it (= perception), and hence it is incapable of grasping pervasion which covers all cases [including past and future cases where there can be no sense-object contact]" (PKM 177). Pervasion cannot also be known through inference, for inference "is preceded by knowledge of pervasion; if knowledge of pervasion is based on inference, there will be infinite regress or circularity" (PKM 178). In other words, if pervasion is known by inference, since that inference itself would be based on some premise involving some pervasion, the latter too would have to be grasped by another inference and so on to infinity. On the other hand, if pervasion is based on inference and inference, in its turn, is based on pervasion, there would be mutual dependence (*anyonyāśraya*), which is a kind of circularity. The Jains argue further that various other knowledge sources, such as authority (*śabda*) and so forth, which could be offered as the means of knowing pervasion, also turn out to be unsuitable (PKM, 349–53).

The Jains, however, accept inference as a source of knowledge and also that inference cannot be without general premises. Accordingly, they offer a certain kind of hypothetical reasoning as the only acceptable means of knowing pervasion. The reasoning is based on perception and nonperception, or, more generally, on awareness (*upalambha*) and nonawareness (*anupalambha*) to cover pervasion involving unobservables (PKM 348). It is set out as a reasoning "being explicable thus" (*tathopapatti*) and "not being explicable otherwise" (*anyathānupapatti*) (PKM 348). It consists in showing that "what is

intended as the probans" (*sādhanatvena abhipretam vastu*) exists or is possible only if "what is intended as the probandum" (*sādhyatvena abhipretam vastu*) exists or is possible and does not exist or is not possible otherwise (PKM 349). In other words, something can be known to be pervaded by something if and only if it is known that the former exists (or is possible) only if the latter exists (or is possible) and that if the latter does not exist (or is not possible), the former does not exist (or is not possible) either. The crucial difference between the methods of multiple observation and single observation on the one hand and the Jain method on the other is that the latter requires, and the former does not, the demonstration that the pervaded indispensably depends on the pervader.

But, to the Carvaka, the method of hypothetical reasoning fails to counter the skeptical challenge. The demonstration of indispensable dependence must presuppose an invariant and universal connection (i.e., pervasion in some form). If the said method is the only means, the pervasion presupposed in the hypothetical reasoning brought in support of pervasion would itself have to be supported by another hypothetical reasoning, and so on *ad infinitum*. The Jain logicians have themselves rejected the method of justifying pervasion through a typical inference (*anumāna*) because of the charge of infinite regress or circularity. The important difference between that typical inference and the hypothetical reasoning recommended by the Jains is the following. In the typical inference, the general premise incorporating the pervasion between the pervaded and the pervader is stated in the form of a universal categorical proposition. In the hypothetical reasoning, the general and indispensable dependence of the pervaded on the pervader is stated in the form of a conditional proposition. How can this mere change in the form of the statement, the Carvaka would say, remove the old and familiar charge?

In the process of justifying pervasion, Jain logicians felt the need of going beyond empirical observation and of demonstrating that the pervaded depends on the pervader. A similar view was developed in a different vein by Buddhist logicians like Dharmakirti (seventh century).[2] Dharmakirti asserts, agreeing with the Carvaka and the Jains, that pervasion cannot be founded on observation of co-presence (*darśana*) or observation of co-absence (*adarśana*) (PV, verse 31, 269). He makes it clear that even if the so-called pervaded is observed to be absent from places where the so-called pervader is observed to be absent, it does not follow that the former is nondeviant from the latter and that possibility of deviation remains (PV, verse 13, 263). He holds that there can be pervasion only if there is a natural connection (*svabhāva-pratibandha*) between two things and further that the only bases of natural connection are identity (*tādātmya*) and causation (*tadutpatti*). Accordingly, identity and causation are the only acceptable grounds of pervasion; unless two things are

related in one of these ways, there can be no necessity (*avaśyambhāva-niyama*) and no pervasion (PV, verses 31–32, 269). Identity is exemplified in such inductions as "all mangoes are fruits" and "all originated things are non-eternal." In such cases there is nondifference (*abheda*) between the pervaded and the pervader (NBD 113). Nondifference implies essential identity (*vastutah tādātmyam*) in spite of the difference in the cognitive contents (*pratyaya-bheda-bheditvam*) of the two expressions (NBD 159, 162).

As the examples show, the relation of identity can hold between classes which are coextensive (as in the case of originated things and non-eternal things) as well as between those which are not co-extensive (as in the case of mangoes and fruits, where the former is the species and the latter is the wider class representing the genus). But in both cases the pervaded suffices by itself alone (*bhāva-mātra-anurodhin*) to provide the connection with the pervader (PV, verse 2, 259). For example, being a mango by itself and without reference to any other factor implies being a fruit, just as being originated by itself and without reference to anything else implies being non-eternal. It appears that in cases of identity or nondifference the connection between the pervaded and the pervader is not synthetic (by borrowing modern terminology). [Thus, if something is known to be a mango, without any further consideration it can also be known to be a fruit; if something is known to be originated, without regard to any other factor it can also be known to be non-eternal.] But the connection is not also analytic if analyticity is understood in a linguistic sense: these truths are non-empty and are about the nature of things. Thus the relation of identity, as understood by Dharmakirti, provides general truths which are non-empty although necessary, but neither synthetic nor analytic.[3]

On the other hand, causation provides general truths which are non-empty, physically necessary and synthetic. In all such cases there is difference (*bheda*) between the pervaded and the pervader and the former cannot by itself alone provide the connection with the latter. Dharmakirti argues that unless two different things are causally related, their connection cannot be necessary (PV, verse 33, 270). He goes on to cite the example of a dress and its color. The color comes into being after the dress. The color is not a cause of the dress and further the inference from the dress to the color would not be based on a necessary connection. The dress could be regarded as an auxiliary causal condition of the color; still the inference from the dress to the color would not be necessary, for the inference from the cause to the effect is not necessary (*ekānta*) (PV, verse 33, 270). It follows that only the cause can be inferred with necessity from the effect and only the effect can be pervaded by the cause and necessarily connected with it, but not vice versa. This is because the effect cannot come into being without the cause; hence the exis-

tence of the effect gives a guarantee for the inference of the cause: the effect thus is necessarily pervaded by the cause. But the effect may not come into being in spite of the presence of the cause if some auxiliary cause is missing. Hence the existence of the cause does not provide a guarantee for the inference of the effect: the cause thus is not pervaded by the effect. Dharmakirti cites smoke as an example of an effect which is necessarily pervaded by fire as the cause and says that there is universal agreement in presence (*anuvṛtti*) between smoke and fire (i.e., every case of smoke is also a case of fire). He points out that if something could come into being without something, the former could not be the effect of the latter (PV, verse 34, 270). Where there is both agreement in presence (*anvaya*) and agreement in absence (*vyatireka*), something is established as the natural (*svabhāva*) cause of something else; in such a case the latter could not come into being from anything else (PV, verse 38, 271). Without any hesitation, he rejects plurality of causes: he claims that if smoke is produced somewhere, fire must be there too, for if nothing of the nature of fire is there, how could smoke come into being (PV, verse 36, 270–71)? Again, "fire is the natural cause of smoke" (*dhūma-hetu-svabhāvo hi vahnih*) and "has the specific power to produce it (*tacchakti-bhedavān*); if smoke were to come into being without its cause, it would have to be uncaused" (PV, verse 37, 271). Dharmakirti rejects the suggestion that effects are uncaused, for then it cannot be explained why they come into being at specific times and not at other times (*kādācitka*). Only what is eternal or unreal is uncaused; the very fact that something comes into being at a certain time and not at any other time proves its dependence on something else which is the cause (PV, verse 35, 270).[4]

Could there be pervasion between two things even if they are related neither by way of identity nor by way of causation? Durveka Misra (the author of the *Pradīpa* subcommentary on the *Nyāyabindu-Tīka*) has considered a number of possible exceptions, such as light and shade, the upward and downward movements of a scale, color and taste (of a fruit), hands and feet, the rise of the moon on the one hand and the rise of the sea or the blooming of night flowers on the other, the rise of a certain star and the rise of another star, and so on.[5] He points out that although in these cases neither is directly the cause or the effect of the other, both are nevertheless co-effects of the same cause (*eka-sāmagryadhīna*). He also considers certain other possible exceptions, such as mendicants and their sticks, disturbed mongooses and snakes, and so forth. He agrees that these are not related by way of either identity or causality, but he rejects these as cases of pervasion. Thus the view that there is pervasion if and only if things are related by way of identity or causation is secured.

Dharmakirti's views are highly influential and have been widely discussed. One well-known problem is: how can it be known that two different things are

causally related? As Prabhacandra argues (PKM 511–13), when fire is claimed to be the cause of smoke, is this relation known from the perception of fire, or from the perception of smoke, or from the perception of both? It cannot be from the perception of fire alone, for that tells us only about fire and not about smoke, and without the knowledge of both there can be no knowledge of the relation between the two. For the same reason it cannot also be from the perception of smoke alone. Thus the only remaining alternative is that the causal relation is known from the perception of both. But this too is not acceptable, as Prabhacandra continues to argue in a vein similar to that of Jayarasi mentioned above. The perception of both smoke and fire tells us only about smoke and fire and does not tell us that fire is the cause and smoke is the effect. If the mere perception of smoke and fire suffices for the knowledge that fire is the cause of smoke, from the perception of any two things which are not, admittedly, causally related, such as a pot and a cloth, it should become known that they are so related. It may be said that causation is known, not from the mere perception of two things, but from the perception of succession of one by the other. But this is of no avail, for there could be perception of succession between a pot and a cloth too. It could be said that from the knowledge that smoke exists only where fire exists and does not exist where fire exists not, it is known that fire is the cause of smoke. But then it can justifiably be asserted that all speakers are possessed of attachment (PKM 512). To explain: since average speakers like ourselves are possessed of attachments toward various things and since stones and other items are neither speakers nor possessed of attachments, it should follow with equal cogency that all speakers have attachment. But this would contradict the Buddhist view, fully supported by Dharmakirti, that although Buddha spoke about the truth, he possessed no attachment. The point is that agreement in presence and agreement in absence cannot provide the guarantee that fire is the cause of smoke any more than it can provide the guarantee that all speakers are possessed of attachment. Finally, the claim that fire is the cause of smoke comprises all fires and all smokes located anywhere and anytime. It is beyond the means of perception to deliver any such knowledge. It may here be pointed out that Dharmakirti himself declared that pervasion could not be known from perception of co-presence and perception of co-absence. He also held that when there is knowledge of agreement in presence and agreement in absence between two things, one of them is known to be the cause of the other. But knowing one thing to be the cause of the other implies that one is pervaded by the other. If pervasion cannot be known from perception of co-presence and co-absence, how can causation, which implies pervasion, be known from that very source?

Accordingly, the skeptics of the Carvaka school claim that the problem of induction is insoluble and, therefore, that inferences based on inductive prem-

ises are not acceptable as contributing to sources of knowledge (*pramāṇa*). The Carvaka critique of induction and inferences employing inductive premises is substantially similar to Hume's skeptical attack on induction and inferences regarding matters of fact. Hume says:

> [Experience] shows us a number of uniform effects, resulting from certain objects, and teaches us that those particular objects, at that particular time, were endowed with such powers and forces. When a new object endowed with similar sensible qualities, is produced, we expect similar powers and forces, and look for a like effect. . . . But this surely is a step or progress of the mind which wants to be explained. . . . For all inferences from experience suppose, as their foundation, that the future will resemble the past, and that similar powers will be conjoined with similar sensible qualities. . . . It is impossible, therefore, any arguments from experience can prove this resemblance of the past to the future; since all these arguments are founded on the supposition of that resemblance.[6]

Hume's argument shows not merely that induction is fallible or that inductions with true premises cannot always have true conclusions. Rather, it shows much more radically, that the claim that any induction is true is not justified.

There are (not surprisingly) substantial differences between Carvaka and Hume. The former does not accept memory as knowledge; the latter does. Some followers of the former refuse the status of knowledge to even perception; the latter does not. The Carvaka as represented by Nyāya philosophers like Udayana and Gangesa thoroughly investigates the nature of adjuncts (*upādhi*) to show that induction has no rational foundation. In particular, the Carvaka argues that the elimination of all imperceptible and suspected adjuncts is impossible. Hume shows no awareness of the important topic of adjuncts or the distinction between certain and suspected adjuncts on the one hand and the distinction between perceptible and imperceptible adjuncts on the other. In this respect the Carvaka critique of induction as presented by the Nyāya philosophers is more radical and thorough than the Humean critique.

Still, for Hume, the inductive passage from observed cases to all cases cannot be justified except on the assumption that the nature is uniform and that the future will resemble the past—an assumption that amounts to begging the question. This is similar to the Carvaka argument that if the claim of pervasion is justified through inference, one would have to use pervasion itself, inviting either vicious regress or circularity. Both refute causality so that the inductive base cannot be provided by the law of causation. Both maintain that practical activities are carried, not on the basis of knowledge, but on the basis of custom/habit (for Hume) or expectation (for Carvaka)—that is, opinion. Both insist that no grounds can be provided for the inductive leap and conclude that induction is unjustified. Again, the Carvaka (and other Indian)

philosophers find the argument from infinite regress and the argument from error to be of great interest in the controversy over justification of knowledge-claim. This indicates their understanding of internalist concerns in the internalist-externalist debate over the analysis of knowledge [without implying that they were (or were not) internalists] and establishes affinity with the Humean view [without, again, implying that Hume was (or was not) an internalist, given that there are many different interpretations of Hume].

Further, the typical paradigm of inference attacked by the Carvaka has three steps: (1) the probans is pervaded by the probandum (*hetuh sādhya-vyāptah*); (2) the probans belongs to the subject (*hetuh pakṣavṛttih*); and (3) therefore, the probandum belongs to the subject (*tasmāt sādhyah pakṣavṛttih*). The Carvaka, throughout its long history, has consistently attacked the first step (which incorporates the generalization) and argued that since the generalization is baseless, so is the conclusion; however, that the conclusion follows from the other steps is not questioned, but, instead, explicitly acknowledged. This is similar to the Humean approach which rejects the rationality of induction, but not of deduction. In this respect the Carvaka-Humean critique differs from that of Sextus Empiricus, the Pyrrhonic skeptic, who attacked syllogism and rejected both deduction and induction. Sextus does not argue that there is no reason for induction or that inductive reasons are not reasons, as the Carvaka-Humean critic does. Again, Sextus distinguishes between indicative signs and associative signs, rejects the former by which we infer something imperceptible from something perceived and appears to lend support to the latter by which we infer from what has been observed something unobserved at present but observable in principle. This differs from Carvaka and Hume, neither of whom advocates such a division of signs.

Hume's critique of induction led to a vigorous study of induction in recent philosophy. Bertrand Russell, a leading philosopher of the twentieth century, holds that all empirically based opinions about the future are based on the inductive principle which experience can neither confirm nor confute: "We must either accept the inductive principle on the ground of its intrinsic evidence or forgo all justification of our expectations about the future."[7] If this dichotomy proposed by Russell is sound, both the Humean and the Carvaka sceptics would have a cause to celebrate, for it is unlikely that either would be persuaded by an appeal to accept the inductive principle on the ground of its intrinsic evidence. In another work[8] Russell has listed five "postulates of scientific inference" as being basic to all nondemonstrative reasoning. The first postulate of quasi-permanence is the following: "Given any event *A*, it happens very frequently that, at a neighboring time, there is at some neighboring place an event very similar to *A*." The other postulates are that the world contains separable causal lines, that there is spatio-temporal continuity of causal

lines, that structurally similar events ranged about a center usually have a common causal origin and that analogies are usually reliable.

But, in the above enumeration, the vague words "frequently," "usually" and "similar" should be rendered more precise (by specifying how much similar, etc.). However, if they are rendered more precise, different sets of presuppositions would result which would inevitably lead to some varying estimates of probabilities. Hence choosing from among different possible sets of postulates is required, but we do not seem to have any grounds for making the choice. Again, these postulates are factual statements about the world. There appears to be no good reason why the skeptic must accept them as true. Thus it does not seem likely that a resolution of the skeptical challenge to scientific knowledge should rest upon such a basis.[9]

To meet the skeptical challenge Strawson and others have argued that the Humean attack on induction is based on the assumption that only those arguments which are deductive and in which, if valid, the conclusion follows necessarily from the premises are rational. This assumption, Strawson claims, is wrong and overlooks the fundamental difference between deduction and induction as well as the fact that the norm of rationality for induction is different from that of deduction. Since the aim of induction is to produce factual knowledge that is not contained in the premises, the conclusion of an induction cannot necessarily follow from the premises. Rather, an induction is rationally justified when it is reasonable and proportionate to the multiplicity and variety of empirical data. Hence, if there are a large number of corroborative instances that are appropriately sampled, the induction is rational and justified. To ask if such a method is rational is like asking whether the law is legal.[10]

But this amounts to claiming that what we mean by induction being rational and justified is that the inductive conclusion is reached by the recommended method. This claim is hard to reconcile with the fact that the method is subject to evaluation, criticism and further revision. Such evaluation and revision presupposes that it makes sense to ask the question whether the currently accepted inductive methods are rational and justified. Being rational and justified, therefore, cannot be synonymous with being bypassed by the current procedure. It may very well be that the criterion of rationality for induction is different from that of deduction. But even if this were true, it does not follow that fulfilling the accepted inductive requirements automatically amounts to satisfying the said criterion. Further, if the norm of rationality for induction is different from that of deduction, as Strawson grants, how can we know that the same evaluative notion, viz., rationality, is applicable to both? After all, in deduction the conclusion follows necessarily from the premises, but in induction does not. In induction one goes from cases observed to cases

unobserved, but in deduction does not. How, then, can we be sure, without any further ado, that both, in spite of being so importantly different, are rationally justified? Could it not be that since induction is so dissimilar to deduction, it is appropriate to restrict the concept of rationality to the latter and not extend it to the former?

Still others have claimed that since inductions using accepted procedures have been true or largely true, it follows that induction is justified.[11] But such an inductive justification of induction is circular, for the very question raised by Carvaka and Hume is whether regularity in the past can be the proper reason for regularity in the future. R. B. Braithwaite has tried to avoid the charge of circularity as follows. According to him, if a person B believes (1) that the policy of induction is effective and also believes (2) that the inductive principle, which supports this conclusion, is effective, B may infer that the inductive policy is effective. This inference is "subjectively valid" and, Braithwaite points out, not circular, because it is not required that B's belief in the conclusion that the inductive policy is effective should be a reasonable one.[12]

This may be so, but the criterion of "subjective validity" is too weak, as the following example shows. Let B believe that all inferential policies are effective and also believe in the principle of inference that any passage from any premise to any conclusion is sound. Then B may infer that all inferential policies are effective. This inference will be subjectively valid and noncircular in Braithwaite's sense. But such a demonstration of the effectiveness of all inferential policies is futile as is the said demonstration of the effectiveness of induction.

Braithwaite has proposed to offer a stronger criterion of validity by adding a third condition that the principle of inference, in accordance with which the conclusion is reached, should be effective. If this third condition is fulfilled along with the two previous ones, the inference is "both subjectively and objectively valid."[13] But then, as he himself concedes, the reasoning will be implicitly circular; for to have a reasonable belief in the effectiveness of the inductive principle an inference of exactly the same sort would be required to establish it. Braithwaite holds, in the vein similar to that of Alice Ambrose, that the rule or policy of induction is not a premise of inductive reasoning, but a principle of inference following which inductive reasoning is carried out.[14] The charge of circularity, however, as Nicolas Rescher points out, does not disappear.[15] For the contention is still that we can show that the inductive rule is justified and validate the belief that this rule is reliable by this rule itself. This argument can be successful only if we already have an independent and adequate justification of the inductive rule—that is, only if the argument is pointless and dispensable. Thus the inductive justification of induction fails to overcome the Carvaka-Humean objection that one cannot validate the general policy of appealing to experience by an appeal to experience itself.

The rule of induction permits us to go from observed cases to unobserved cases and from smaller percentages to larger percentages (including 100 percent) of the whole class. In a special form this has been interpreted by Reichenbach, Salmon and so on, to prescribe that the probability value is equal to the observed frequency—that P(A/B) = m/n, where n is the number of observed events B and m is the number of those observed B which have the property A. Reichenbach (who calls the inductive rule the "straight rule") and Salmon (who calls the inductive rule also the "rule of induction by enumeration") have argued that if there are any laws of nature to be found, persistence with the inductive rule would lead to their discovery, but there is no certainty that the laws of nature will be found if the rule is disowned.[16] In particular, if there is no limit of the relative frequency of the events A in the set of events B, it cannot be specifically determined by any rule, but if there is a limit, it may be possible to discover it and specify its value. Thus the above rule, it is claimed, will work if any will. When it is backed by a sufficiently large number of careful observations and experiments, the law of large numbers would ensure that the probability value is close to the observed frequency. This, then, pragmatists like Reichenbach and Salmon claim, provides a vindication of induction, although Reichenbach himself was quick to concede that we are not able to prove that the success of induction is necessary, or even probable.[17]

Many difficulties in this viewpoint have been pointed out. Thus, even if any laws of nature are found by the use of the inductive rule (since we do not know how many observations will be needed), it would not be possible for anyone to know when they have been found.[18] Further, scientists try to predict short-run relative frequencies, but the straight rule does not ensure that such predictions are correct.[19] Moreover, Reichenbach himself noticed that the argument for the straight rule recommends equally an infinity of inductive rules, the asymptotic rules, which prescribe estimating P(A/B) = m/n + f(n), where f(n) is a function of the number of observations n, which decreases to zero with the increase of n. Since there is no objective ground for choosing among these rules, there will also be no objective ground for choosing among our predictions, which will vary enormously depending upon which rule is used.[20] Again, Carnap has argued that the straight rule would lead to hasty generalizations.[21] Finally, even if it were true that continued use of the straight rule would lead to the discovery of scientific laws, it cannot be claimed, without assuming that the future will resemble the past, that this trend will be maintained. Hence the pragmatist justification, too, if the claim of proving the rationality of induction is included, will be open to the charge of circularity.

Another well-known recent view is that of anti-inductivism mooted by Karl Popper.[22] Popper agreed with Hume that ampliative induction has no rational validity. Hence he sought to substitute the inductive model of empirical sci-

ences by the so-called hypothetico-deductive model and held that valid science is invariably deductive and never inductive.[23] While, according to the inductionists, the aim of science is verification of hypotheses, according to Popper the proper aim is their falsification. The latter is done by the logical procedure of *modus tollendo tollens*: if a prediction deduced from a hypothesis turns out to be false, the hypothesis is falsified. For example, the hypothesis that all A is B warrants the prediction that the next A one is about to observe is B and is falsified when that A is actually found not to be B.

Popper was well aware that falsification cannot be the whole story, for at a given time more than one hypothesis could pass the most rigorous tests available. In such a situation, the choice among competing hypotheses would depend on which hypothesis has the richer information content, is formulated in a more precise way and provides the explanation of a larger number of facts.[24] Popper maintained that all these qualities of a hypothesis or theory normally go hand in hand with a higher degree of falsifiability, for the more general, the more precise and the more comprehensive is a hypothesis, the larger is the set of its potential falsifiers.

There is no doubt that the hypothetico-deductive method and falsifiability have their roles to play in science. But these do not necessarily exclude induction and inductionists need not deny the importance of either. But, on the other hand, for the acceptance of a hypothesis or a theory what is more important is not that it is not falsified, but that it has survived rigorous tests that could have refuted it. The more rigorous and the more potentially falsifying are the tests to which the hypothesis is put, the better confirmed and the more acceptable is the hypothesis. Thus the measure of severity of the tests is the measure of the degree of confirmation of a hypothesis. The hypothesis does not logically follow from the test although the latter does confirm the former. This shows that induction remains an indispensable part of the scientific method, for the confirmation of hypotheses by tests utilizes it. In fact, a distinction should be drawn between the confrontation of the results of observation with the hypothesis and its acceptance or rejection. The former involves the examination of logical relations between the statement of the hypothesis and the statement of the test result. But the latter is pragmatic in character and involves considering such issues as simplicity, explanatory value, and so on, and goes beyond observation and deduction.

Popper, of course, denied that the notion of testing of a hypothesis by observation involves induction. He substituted the notion of confirmation by that of corroboration and held that a hypothesis is corroborated by observation reports only if the latter is an account of the results of genuine attempts to falsify the hypothesis and not attempts to verify it.[25] He added that the notion of genuineness cannot be formalized. But, clearly, genuineness cannot be

explained in terms of the psychological attitude of the observer, for that would conflict with Popper's sworn aim of ridding scientific methodology of all elements of psychologism and subjectivism. Rather, it could be interpreted, consistently with what is said above, as a postulate that if there are experiments which have a high chance of falsifying the hypothesis, the latter should be subjected to them (in preference to other experiments which have a low chance of falsifying it). But, when interpreted in this way, the postulate of genuineness is well known to inductionists and fully consistent with their common understanding of confirmation. Again, the big problem for the notion of corroboration is that Popper gives us no reason to think that highly corroborated theories are more likely to be true. (Thus, why should we care about corroboration?) Further, a major flaw of mere falsificationism, as Nicholas Rescher has remarked, is that falsifying a hypothesis is no more than eliminating one possibility.[26] The elimination can be a sure method of drawing near to acceptance only if existence of only a finite number of possibilities is already known or perhaps it is granted that the human mind has a natural inclination to move toward something better. Short of justification of such large metaphysical claims, induction remains an indispensable element in the process of confirmation. Moreover, the contrast between verification or confirmation and falsification is not as pronounced as Popper assumed. For an inductionist, so thought Popper, truth is the only aim of science. But it need not be so and, for inductionists, acceptance by way of induction need be neither infallible nor permanent. An inductionist acknowledges the value of falsification within his method and Popper's crusade against induction appears to be misguided. Indeed, the methodology of science—despite the effort of Popper—can neither banish induction nor ignore the problem of induction.

Thus the Indian and Western theories above fail to provide a solution to the problem of induction. However, there is optimism in some quarters that a solution may be found from the study of probability to which we turn next.

Indeed, in some recent studies induction and probability have become closely linked. This may be due to the common conviction that although empirical generalizations and theories cannot be rendered certain on the basis of observation, they can be rendered more or less probable. Accordingly, the justification of induction has been sought to be founded on probabilistic criteria. There are, however, serious differences of views regarding what is this inductive probability on which inductive logic should be based. We now briefly discuss some of the important accounts of probability in modern philosophy.

First, we look at the logical interpretation of probability. Although there is no universally agreed meaning of this notion, it draws its inspiration from the idea that probability depends on (some) relationships between sentences.

Such relations hold between sentences by virtue of their logical structure that is determined by the connectives, the quantifiers and so on, regardless of the sense of the nonlogical contents.

J. M. Keynes, who first developed a detailed theory of logical probability, thought that the latter is not definable (TRP 8). For the source of numerical values for the probability calculus, he relied on the classical principle of indifference. The latter assigns equal probabilities to those events whose chances of occurrence are not expected to be different (TRP 65). But he recognized that the principle is not universally applicable, took this to entail that not all probabilities are numerically measurable and held further that some probabilities are not comparable with one another.

It was Rudolf Carnap who showed in works dating from the 1950s[27] that it is possible to develop a method that gives effective estimates of logical probabilities (called by Carnap "probability$_1$") for all sentences in a given formal language. [Carnap also recognized what he called "probability$_2$" the value of which is established empirically and accepted its identification with the relative frequency in certain cases: LFP xiv, 294.] The latter was a standard type of logical language with a finite number of monadic, first-order predicates F, G, H (like "is blue," "is human" and so forth, naming properties) and a finite number of individual constants a, b, c (naming individuals). An atomic sentence is an assignment of an individual constant to a predicate—for example, *Fa* (like "John is human"). A state description is a conjunction of sentences containing every atomic sentence or its negation but not both (LFP 71). Thus a state description completely describes the universe in the given language by affirming or denying each property of each individual. The logical range of a sentence may then be defined as the class of state descriptions in which, for each state description, the sentence is true if individuals have exactly those properties assigned to them by the state description.

It may be seen that if a sentence *p* follows logically from a sentence *q*, the logical range of *q* is included in the range of *p*. But if *p* and *q* are logically inconsistent, the ranges of *p* and *q* are disjoint. On the other hand, if *p* and *q* are logically consistent, but neither follows from the other, their logical ranges would overlap to a greater or smaller extent. Accordingly, in Carnap's view, logical probability is the measure of the degree of overlapping of the logical ranges of sentences. This is called the probability confirmation function and symbolized as *c*. The value of c(p/q) corresponds to the confirmation of sentence *p* by sentence *q* on the basis of the logical relation between *p* and *q*.

One important kind of confirmation function is the one called "symmetrical." In a symmetrical confirmation function all individuals are treated alike; hence one individual constant within the function's scope may be uniformly replaced by another so long as this does not change the given identity between

occurrences of those constants. Under these circumstances, it is possible to give the same real number to each state description of any kind. The symmetrical confirmation function which is evaluated thus in any language is called "c+." But it is also possible to suppose on the other hand that patterns of state descriptions, rather than individual state descriptions, should be put on a level with one another. Such a pattern is called a structure description and defined as disjunction of isomorphic state descriptions (LFP 116). Every structure description is a complete description of the world, although, as distinguished from a state description, it is a statistical description. The same real number may, under these circumstances, be given to every structure description and a measure be fixed for each of the *n* disjointed state descriptions within a particular structure description by dividing the number of that structure description by *n*. A confirmation function which is evaluated thus is called "c*." Carnap showed that c+ and c* have important differences and approved the latter as appropriate for inductive logic. It was also made clear that any number of other symmetrical c-functions could be formulated leading to other bases for the *a priori* measurement of probability understood as a logical relation.

Carnap's system, however, produces unwelcome results for situations which are regarded typical for induction, his favorite confirmation function c* being no exception. In fact, $c^*(p/q) = 0$ where q is an observation report and p is a nontautological generalization in a universe with an infinite number of individuals. This is unsatisfactory and implies that any generalization over an infinite domain is as worthless as any other. Further, even when the number of individuals in the domain is not infinite, but very large, the values of c* will be very small and tend to zero. This is because a generalization is logically equivalent to a conjunction of singular statements saying of each individual in the domain that it has the given property; hence, the larger the number of conjuncts, the fewer are the possible worlds in which the conjunction is true and lower is the confirmation value. It follows thereby that the degree of reliability of such a generalization would not increase with the increase in the number of confirming observations (even when there are no counterexamples).

It is clear that the only cases where the confirmation values of empirical generalizations will not tend to zero are those in which the number of observed objects is close to the total number of objects in the domain (i.e., when "enumerative induction" comes close to "summative induction"). Carnap himself was not worried over these difficulties, for he held that scientific activity should be construed exclusively in terms of that which directly serves practical activity and that what is needed is the degree of confirmation of individual hypotheses and not that of universal hypotheses. But such a narrow-minded view of science is clearly unacceptable, for even rational decisions to act in particular situations may sometimes require seeing individual phenomena or

particular uniformities in the light of much wider universal laws. Further, while practical technologists like engineers, navigators and so on may choose to overlook general laws (such as Newton's laws of motion), this cannot be done by theoretical scientists, such as astrophysicists.[28] At any rate, whatever may be the merit of Carnap's view of science, his theory does not solve our main problem which is that of justifying inductive generalizations over domains in which the number of individuals is often very large/unknown.[29]

Another currently discussed interpretation is the subjective or the personalist view of probability. This was mooted by F. P. Ramsey and then developed further by B. de Finetti, L. Savage and R. Jeffrey.[30] The fundamental thesis here is that objective probabilities are an illusion or a superstition, and that probabilities depend essentially on someone's beliefs. Thus, in Ramsey's view, the probability of a statement measures the degree of rational belief of the person making the statement. Beliefs or convictions are not understood in terms of introspected feelings; rather, they are taken in a behavioristic way as definite actions which should result from beliefs in situations of making a decision. Thus, in the situations of making bets on an uncertain event, the lowest odds accepted by a person will decide about the belief of that person. For example, if Smith bets at four to one that the government will fall, but not at anything lower than four to one, he has a 1/5 degree of conviction that the government will fall.

Subjective probability is understood as the function of beliefs that are "coherent" and are not such as to ensure a loss to the bettor no matter what happens. For example, if a person bets three to two that the government will fall and also bets four to one that the government will not fall, he will lose no matter what. Such a belief is "incoherent" and left out of purview. Ramsey and de Finetti proved that a set of degrees of belief that are "coherent" satisfies the axioms of probability calculus.

Subjectivistic theories have allowed extensive use of Bayes's Theorem, which puts P(A/B) as being equal to

P(B/A) x P(A)
P(B)

where $P(B) > 0$. Some nonsubjectivists prefer a very limited use of the theorem because the initial probabilities in the formula are often unknown. But since there are no objective probabilities from the subjectivistic point of view, there are also no unknown objective probabilities. Hence the investor may begin by assigning a chosen value to the initial probabilities (i.e., by deciding his lowest acceptable betting odds), before considering the evidence. Once the values are established in this way, the desired probability may be computed

with the help of the formula. In actual cases a good deal of empirical data are often accumulated, so that the initial chosen values eventually get rapidly diminishing roles in yielding the answer. Hence, from the subjective Bayesian point of view, differences in prior probabilities are not very material: as more and more evidence is gathered, these differences wash out, the posterior probabilities merge and lead on to the same final degrees of belief. Thus, "the particular form of the prior distribution expressing beliefs held before the experiment is conducted is not a crucial matter. . . . The well-designed experiment is one that will swamp divergent prior distributions with the clarity and sharpness of its results, and thereby render insignificant the diversity of prior opinion."[31]

Numerous logicians, however, have objected to the idea that probabilities should be identified with belief functions. Thus I. Levi has argued that subjective probabilities lead to counterintuitive results. For example, if somebody has no reason to believe that some event A will take place rather than not, the correct measure of the degree of belief that A will happen as well as that A will not happen would be zero.[32] Again, according to Levi, if the degree of belief about hypothesis A is less than equal to the degree of belief about another hypothesis B, the degree of belief about the conjunction of A and B would be equal to the degree of belief about the former. But the probability of a conjunction is usually less than that of each conjunct. This tends to show that beliefs are not probabilities.[33] Further, H. Kyberg has shown that the identification of probabilities with the behavior of betting fails in numerous cases. For example, a bet about the truth of a universal statement is meaningless, for it cannot be decided.[34] Moreover, the behavior of betting appears to depend on a number of factors (e.g., a person's financial condition), the influence of other bettors, and not merely on the beliefs that some events will or will not take place. This raises questions about the behaviorist interpretation of beliefs. Moreover, it is difficult to accept that there are no objective probabilities whatsoever. It is true that much of statistics is justified and accepted because it works and that the selection procedure is often based on our beliefs and desires. But this does not detract from the common conviction that some things are more/less probable than others. For example, that a fair coin will land heads more than 20 percent of the times is more probable than that it will land heads less than 5 percent of the times. The professional gambler, again, is favored to beat the novice, because the former plays the percentages—and the percentages are real. The greater probability of these is not dependent on beliefs or opinions, but, the critic would insist, on objective facts.[35]

Finally, for the convergence to certainty and merger of opinions one supposes that all of the Bayesian agents accept the trials to be independently and identically distributed. But such conditions, as Mary Hesse points out, do not hold for

scientific inferences in general, particularly when nonstatistical hypotheses are involved.[36] Different Bayesian agents may also give, as John Earman observes, different estimates of rates of convergence. One may try to estimate the rate of convergence by getting an average of the rates for different evidence sequences that would require assigning weights to the sequences. But it is not clear that all Bayesian agents will agree to the same function for assigning weights.[37] Further, as Earman argues, the thesis of convergence to certainty implies that the Bayesian is virtually certain from the beginning that the actual world lies in a narrow enough range of possibilities, so that the truth or falsity of any empirical hypothesis can be reliably determined. But this amounts to a claim of dogmatic and substantive *a priori* knowledge. An astrophysicist, for example, may possess enough information *ab initio* to guarantee that the truth-value of that most stars have planets and most planets have at least one moon is decidable. But it appears to be wrong to require that the astrophysicist begin the inquiry with such *a priori* knowledge about the nature of the world.[38]

We now move on to consider the viewpoint that probability is objective. Thus, according to Karl Popper, probability is best understood as a propensity or a disposition of objects toward specific types of characteristics with determinate frequencies.[39] This propensity analysis should be distinguished from the frequency analysis favored by von Mises, Reichenbach and so on, according to which probabilities are not related distributively to each member of the reference class, but should be identified with some collective property of the reference class.[40] So, for Popper, the 1/2 probability that an unbiased coin will fall tails is a propensity pertaining to each coin toss and not a relative frequency characterizing the set (sequence) of coin tosses, as it is for von Mises and others. Relative frequencies observed in appropriate samples are, for Popper, the external, observable manifestations of the propensity or the hidden dispositional property, but should not be identified with it.

The propensity analysis does not have some of the problems of the frequency analysis. From the latter point of view it is difficult to give an account of the probabilities of individual events, for it is features that have relative frequencies. (Indeed, some frequency theorists like von Mises have denied that there is any such thing as the probability of a single event: PST 15.) But the former allows assigning probabilities to individual events, for propensities may be regarded as properties of some kind of individual arrangements. Further, the propensity account works for both finite and infinite classes while the frequency account faces difficulties when the reference classes are infinite. For while each member of an infinite collection cannot be individually examined, the relative frequency value of any finite subsequence is agreeable with any value of the limit of relative frequency in the infinite sequence. Still, the propensity theory does not have a large following (although the following has

grown recently). While the frequency theory states an estimable ratio for actual evaluation of probabilities, the propensity theory does not, for dispositions do not have specific numerical implications.

However, for both these theories, a probability value is a measure of an empirical, physical fact about the external world. Hence they are opposed to the logical interpretation that holds that probability depends on logical relations between sentences and also to the subjectivist thesis that probability is an index of rational beliefs or attitudes. Thus Popper thought of propensities as "a new physical hypothesis . . . analogous to the hypothesis of Newtonian forces." Similarly, von Mises said about probability in dice games: "The probability of a 6 is a physical property of a given die . . . analogous to its mass . . . or electrical resistance."[41] In this respect, from the viewpoint of justification of induction, the difference between the two theories is not very great. Since the propensity probabilities are estimated on the basis of observed relative frequencies, an empirical method is adopted by both for estimating probability values. Accordingly, if the probability values are estimated by using primarily inductive methods, the attempts to justify induction with reference to such inductively ascertained probabilities are open to familiar charges of circularity.

The classical theory of probability of course centers on the principle of indifference. According to this principle, if we can discern no reasons for discriminating between alternatives, we should assign equal probabilities to them. Thus, from the point of view of an indifference theory, probability may be defined as the ratio of the favorable cases to the total of equally probable cases. In the words of Laplace: "The theory of chance consists in reducing all the events of the same kind to a certain number of cases equally possible, that is to say, to such as we may be equally undecided about in regard to their existence, and in determining the number of cases favorable to the event whose probability is sought. The ratio of this number to that of all the cases possible is the measure of this probability, which is thus simply a fraction whose numerator is the number of favorable cases and whose denominator is the number of all the cases possible."[42] Laplace has avoided any patent circularity, for the word "probability" does not reappear in his definition. He seems to have given "equally probable" a sense independently of probability by requiring that (a) they must be "equally possible" and (b) "such as we may be equally undecided about in regard to their existence."

But the indifference theory is open to many objections. The theory speaks of "equipossible" cases that must be such as to which we have no grounds to prefer one to the other. Hence the theory faces difficulty when there is evidence to show that the different outcomes are not equally probable. For instance, it may be known during a long run of trials that one side of a die turns up much more often than any other, but it may not be known which way the

die is biased. Under these circumstances, the indifference theorist would still say that the probability of any one side coming up is the same as that of any other which, as remarked by Henry Kyburg, is "strange enough."[43]

Again, this theory lands in difficulty where the evidence for different outcomes is not symmetrical. For instance, a coin may be found after a long run of throws to land heads twice as often as tails. Here the probability of landing heads may be said to be 2/3 and that of landing tails 1/3. But this does not make good sense from the point of view of equipossible outcomes. The coin, although loaded, still has only two sides of which only one shows the head. How can it be then that the ratio of favorable alternatives to the total of equipossible outcomes is 2/3? Hence, as Kyburg observed, philosophers had no choice but to regard the indifference theory as seriously flawed: "In many cases . . . the only way of arriving at probabilities was *not* to compute numbers of equally likely alternatives."[44]

The above survey of modern theories of probability is admittedly brief.[45] Still, it indicates that there are serious difficulties in various attempts to solve the classical problem of induction with the help of the concept of probability that may eventually turn out to be no less problematic than induction itself. It thus appears that none of the viewpoints discussed above provides an adequate solution to the Carvaka-Humean critique of induction.

NOTES

1. K. Chakrabarti, "The Nyāya-Vaiśeṣika Theory of Universals," *Journal of Indian Philosophy*, 3, 1975, 363–82.

2. Dharmakirti, a great Buddhist philosopher, is the author of such famous works as the *Parmāṇavārttika*, the *Vadānyāya* and so forth. His *Nyāyabindu* together with the commentary by Dharmottara has been translated into English with an elaborate exposition by T. Stcherbatsky, *Buddhist Logic*, Vols. 1 and 2, Dover, New York, 1962.

3. For further discussion, see K. Chakrabarti, "Svabhāvahetu in Dharmakirti's Logic," *Philosophy East and West*, 37, 1987, 392–401.

4. Dharmakirti may be the first to use this argument explicitly to defend causality. A sharper and more elaborate version of the same argument is found in Udayana and his commentators: *Nyāyakusumañjali*, 9ff.

5. *Dharmottarapradīpa* of Durveka Misra, ed. Dalsukhbhai Malvania, K. P. Jayswal Research Institute, Patna, 1955, 115.

6. David Hume, *An Enquiry Concerning Human Understanding*, ed. L. A. Selby-Bigge, Clarendon Press, Oxford, 1902, 36–37.

7. Bertrand Russell, *Problems of Philosophy*, Oxford University Press, Oxford, 1959, 68.

8. Bertrand Russell, *Human Knowledge: Its Scope and Limits*, Simon and Schuster, New York, 1948, part 6.

9. R. B. Braithwaite, *Scientific Explanation*, Cambridge University Press, Cambridge, 1953: *Rereading Russell*, University of Minnesota Press, Minneapolis, 1989, 200–219.

10. P. F. Strawson, *Introduction to Logical Theory*, Methuen, London, 1952, 248–50. See also Halina Mortimer, *The Logic of Induction*, Ellis Horwood, Chichester, UK, 1988, 74–75.

11. See R. B. Braithwaite, *Scientific Explanation*, Cambridge University Press, Cambridge, 1953, 255–92. Reprinted in part as R. B. Braithwaite, "The Predictionist Justification of Induction" in the *Justification of Induction*, ed. R. Swinburne, Oxford University Press, Oxford, 1974 (abbreviated as *JI*), 102–26. See also Max Black, "Self-Supporting Inductive Arguments" and the exchange between Peter Achinstein and Max Black in this same book. See further Abner Shimony, "Braithwaite on Scientific Method," *Review of Metaphysics*, 7, 1953–1954, 644–60, and H. E. Kyburg, "R. B. Braithwaite on Probability and Induction," *British Journal for the Philosophy of Science*, 9, 1958–1959, 203–20.

12. *JI*, 123–24.

13. *JI*, 124–25.

14. Alice Ambrose, "The Problem of Justifying Inductive Inference," *The Journal of Philosophy*, 44, 1947, 260ff.

15. Nicholas Rescher, *Induction*, University of Pittsburgh Press, Pittsburgh, 1980, 117–19.

16. Hans Reichenbach, *Experience and Prediction*, University of Chicago Press, Chicago, 1938. Wesley C. Salmon, "The Pragmatic Justification of Induction," *JI*, 84–97.

17. Hans Reichenbach, *The Theory of Probability*, University of California Press, Berkeley, 1949, 479.

18. John W. Lenz, "Problems for the Practicalists's Justification of Induction," *JI*, 99.

19. *Ibid.*, 101.

20. *Ibid.*, 98–99.

21. Rudolf Carnap, *Logical Foundations of Probability*, Chicago University Press, Chicago, 1950; second edition, 1962.

22. Karl R. Popper, *The Logic of Scientific Discovery*, Hutchinson, London, 1959; main text originally published in German as *Logik der Forschung*, Julius Springer, Vienna, 1934.

23. *Ibid.*, 29–30.

24. *Ibid.*, 113–19.

25. *Ibid.*, 344, 337.

26. N. Rescher, *Induction*, *op cit.*, 217–18.

27. R. Carnap, LFP; R. Carnap, *The Continuum of Inductive Methods*, University of Chicago Press, Chicago, 1952.

28. L. J. Cohen, *An Introduction to the Philosophy of Induction and Probability*, Clarendon Press, Oxford, 1989, 121–12.

29. Jaakko Hintikka, inspired by Carnap's ideas, formulated a method for calculating the measures of the range of a universal proposition without making it dependent on the

number of individuals in the domain. This avoided the assignment of zero confirmation values to universal statements. (J. Hintikka, "A Two-Dimensional Continuum of Inductive Methods," in *Aspects of Inductive Logic*, Hintikka, Suppes (eds), Amsterdam, 1966; J. Hintikka, "Towards a Theory of Inductive Generalization," in *Logic, Methodology and Philosophy of Science*, II, J. Bar-Hillel (ed.), Amsterdam, 1964.) But many difficulties of the Hintikka-type modification of Carnap's system have been pointed out. See Halina Mortimer, *The Logic of Induction*, Ellis Horwood, Chichester, UK, 1988, 61–71.

30. F. P. Ramsey, *The Foundations of Mathematics*, Routledge and Kegan Paul, London, 1931, 156–98; B. de Finetti, "Foresight: Its Logical Laws, Its Subjective Sources" (1937), in H. E. Kyburg and H. E. Smokler (eds.), *Studies in Subjective Probability*, John Wiley and Sons, New York, 1964, 99–158; L. J. Savage, *The Foundations of Statistics*, Dover, New York, 1972; R. C. Jeffrey, *The Logic of Decision*, McGraw-Hill, New York, 1965.

31. P. Suppes, "A Bayesian Approach to the Paradox of the Ravens," in J. Hintikka and P. Suppes, eds., *Aspects of Inductive Logic*, North-Holland, Amsterdam, 1966, 204; quoted in John Earman, *Bayes or Bust?*, MIT Press, Cambridge, Mass., 1991, 142.

32. I. Levi, *Gambling with Truth*, Knopf, New York, 1967, 123.

33. I. Levi, *Ibid.*, 124.

34. H. E. Kyburg, Jr., *Probability and the Logic of Rational Belief*, Wesleyan University Press, Middletown, Conn., 1961.

35. Various revisions and improvements of the subjective viewpoint have been suggested by L. Savage and R. Jeffrey. These modified versions, too, have been shown to open to many difficulties. See H. Mortimer, *The Logic of Induction*, *op. cit.*, 83–89.

36. M. Hesse, "Bayesian Methods and the Initial Probability of Theories," in G. Maxwell and R. M. Anderson, eds., *Induction, Probability, and Confirmation*, Minnesota Studies in the Philosophy of Science, vol. 6, University of Minnesota Press, Minneapolis, 1975, 78.

37. John Earman, *Bayes or Bust?*, *op. cit.*, 149.

38. *Ibid.*, 215–18.

39. K. R. Popper, "The Propensity Interpretation of Probability," *British Journal of the Philosophy of Science*, 10, 1959–1960.

40. R. von Mises, *Probability, Statistics and Truth*, second edition, Dover, New York, 1957; H. Reichenbach, *The Theory of Probability*, University of California Press, Berkeley and Los Angeles, 1949.

41. K. R. Popper, *Realism and the Aim of Science*, Hutchinson, London, 1983, 360; quoted in L. J. Cohen, *An Introduction to the Philosophy of Induction and Probability*, *op. cit.*, 54; R. von Mises, *Probability, Statistics and Truth*, *op. cit.*, 14; quoted in R. Weatherford, *Philosophical Foundations of Probability Theory*, Routledge and Kegan Paul, London, 1982, 183.

42. P. S. de Laplace, *A Philosophical Essay on Probability*, Dover, New York, 1951, 6–7; quoted in R. Weatherford, *op. cit.*, 26.

43. Henry Kyburg Jr., *Probability and Inductive Reasoning*, London, 1970, 33.

44. *Ibid.*, 40.

45. For further discussion, see E. T. Jaynes, *Probability Theory: The Logic of Science*, Cambridge University Press, Cambridge, 2003; C. Hitchcock, *Contemporary Debates in Philosophy of Science*, Blackwell Publishing, Oxford, 2004.

2

The Later Nyāya Solution

The problem of induction is not satisfactorily resolved in the light of the different Indian and Western views discussed earlier, as we have seen. So far as contemporary philosophers are concerned some continue to hold that Hume's critique of induction is justified as the following quotes show: "My primary purpose . . . is to support a claim that . . . Hume's argument is actually correct. . . . [T]hat argument has stood since it was first presented, a philosophical classic . . . withstanding all attempts to overturn it. . . . Hume's argument is one of the most robust, if not the most robust, in the history of philosophy." (*Hume's Problem* (HP), C. Howson, Clarendon Press, Oxford, 2000, 2, 10, 14–15) We shall examine if Hume's and Carvaka's arguments are irrefutable. In the hope of throwing more light on the problem we look at the later or Navya (New) Nyāya position. We do not touch on all of the highly sophisticated viewpoints. Rather, we address some main arguments in later Nyāya.

We first quote a passage from the *Tattvacintāmaṇi* (TC) of Gangesa. [Modern scholars eulogize Gangesa (thirteenth century) as the founder of Navya Nyāya or New Nyāya. The commentarial and supercommentarial literature on TC includes a number of outstanding works, such as Raghunatha's *Dīdhiti* (fifteenth century) and runs into thousands of pages.]

> The removal of that [the apprehension of deviation] is sometimes through counterfactual reasoning or CR (*tarka*) countering the opposite thesis and sometimes comes on its own (*svatah siddhah*). Should there be an infinite regress because CR is based on pervasion? No. CR is resorted to up to the point there is apprehension [of deviation]. Where the apprehension does not arise at all because of conflict, there pervasion is known without CR. Thus: if smoke were produced neither by the aggregate excluding fire nor by the aggregate including fire, it

> would not have come into being. Here there may be deliberation as to: Could it be that smoke always comes into being without fire or sometimes comes into being without fire as well or comes into being without a cause? If one is apprehensive that the effect could come into being without the cause with which there is known agreement in presence and absence, why should that very person regularly procure fire for smoke, food for nourishment or words for communication with others? For, that [the effect] could come into being without that. Therefore, procurement of those itself is the obstruction to that kind of fear. (TC 187–94)

There are three main points in this passage. (1) The skeptical doubt about induction may be countered by counterfactual reasoning: a sample is included. (2) The counterfactual reasoning leads onto a follow up argument from belief-behavior conflict. (3) Since the conflict obstructs the skeptical doubt, no additional reasoning is called for and there is no infinite regress.

We first take up (what for the lack of anything better we translate as counterfactual or subjunctive reasoning: CR) *tarka* or *ūha*. The Jain philosophers, it may be remembered, have given the same name to a kind of hypothetical reasoning. In the Jain version the reasoning uses hypothetical propositions with a true antecedent and a true consequent. The hypothetical forms are "if this, then that" and "if not that, then not this," where "this" signifies the pervaded or the probans (*vyāpta: hetu*) and "that," the pervader or the probandum (*vyāpaka*: *sādhya*): "this" and "that" are replaceable by truth-preserving non-empty names like "smoke" and "fire" to generate true conditionals. However, in a wider sense *tarka* is of five kinds: (1) self-dependence or trying to prove A from A, (2) mutual dependence or trying to prove A from B and B from A, (3) circularity or trying to prove A from B and B from C and also C from A, (4) infinite regress and (5) undesirable consequence where the first four kinds are included in the last (ATV 863). What is an undesirable consequence? As Varadaraja explains, it is rejection of something reliable or acceptable (*prāmāṇika-parityāgah*) or acceptance of something unreliable (*tathetara* or *aprāmāṇika-parigrahah*) (TR, verse 70). That is, in a *tarka* a hypothesis is shown to involve rejecting something reliable or accepting something unreliable and is thereby disfavored. In the context of supporting an induction, *tarka* proceeds by showing that the supposition that the induction is false leads to an undesirable consequence. (Examples of such *tarka* are given below.) Specifically, in a narrower version, *tarka* stands for reasoning with a counterfactual hypothetical proposition that is known to have a false antecedent and a false consequent. The Nyāya philosophers operate with an internal realistic, utility-linked version of correspondence to give an account of truth or reliability (*yāthārthya, prāmāṇya*).[1] However, they explicitly label the counterfactual proposition as false while granting that it is subservient or conducive (*sahāyaka*, *anugrāhaka*, *upayogin*, *prayojaka*) to truth.[2]

In the TS, *tarka* is explained as "the factitous supposition (*āropa*) of the pervader due to the factitious supposition of the pervaded" (351). Thus in a counterfactual reasoning both the antecedent and the consequent of the conditional premise are willfully made false assumptions. Further, the assumptions must have an important relationship. The antecedent must be the assumption of the pervaded and the consequent, that of the pervader (*vyāpya-āropeṇa vyāpaka-āropah*). Based on that relationship one can validly make the counterfactual claim that if the antecedent were true so would be the consequent. In other words, the conditional premise is such that it can reasonably be ruled out from what we know that the antecedent is true, but the consequent, false. [Since the conditional premise is explicitly labeled as false, it follows that the Nyāya logicians are not using material implication. If this were a material implication, the conditional would have been true.]

As an example, the TS (351) cites the proposition "if there were no fire, there would be no smoke." This may refer to the particular inferential situation where it is known that smoke and (therefore) fire are present. Then it would amount to saying that if there were no fire in a given location, there would be no smoke in that location. Alternatively, the conditional may refer to the imagined absence of all fires and all smokes in the universe. On either construal both the antecedent and the consequent are taken to be false. The antecedent contains the absence of fire that is the pervaded and the consequent, the absence of smoke that is the pervader; that is, it is known in each observed case that where there is absence of fire, there is absence of smoke. From this (and the observation of co-presence of smoke and fire and so on) it has been surmised that fire is a necessary condition of smoke, so that absence of fire implies absence of smoke. Since the premise is about the presence of the pervader on the condition of the presence of the pervaded, that the antecedent is true and the consequent is false is ruled out. This is important. Although the conditional is labeled as false, it is still subservient or conducive to truth. If it were a conditional with a true antecedent and a false consequent, its status would have been different. Since, however, both the antecedent and the consequent are taken to be false, each is described as a factitious supposition (*āropa*). It differs from an ordinary error (*viparyaya* or *bhrama*) where the falsity is undetected. Such a factitious supposition is a kind of *āhārya* cognition where the characteristic of being *aharya* is explained as "being willfully caused in spite of falsity" (*bādha-kālīna-icchā-janyatva*).[3]

Vyasatirtha has criticized this view of *tarka* by claiming that this overextends to such a false inference as that of fire from mistaking vapor as smoke (*Bāṣpe dhūma-bhrama-janya-bhramarūpa-anumitau ativyāpteh*, TTD 140). That is, vapor is not smoke. Thus this inference proceeds from the mistaken identification of something with something else that is pervaded and seems to

fit the account of inferring through the factitious supposition of the pervaded. But this criticism overlooks that *tarka* differs from an error where the falsity is not known and that in a *tarka* both the antecedent and the consequent are willfully made assumptions in spite of being known to be false.

In Vyasatirtha's view *tarka* is not merely conducive to truth as the Nyāya holds but is a kind of inference. According to Vyasatirtha, *tarka* is an inference by way of refutation (*dūṣaṇa-anumāna*). For example, the *tarka* that if there were no fire there would have been no smoke (*yadi niragnikah syāt tarhi nirdhūmah syāt*) refutes that there is no fire. Since refuting that there is absence of the probandum is based on pervasion (*vyāptibalena gamakatvāt*), *tarka* should be accepted as a kind of inference (TTD 139–42). [Although Vyasatirtha accepts *tarka* as an inference by way of refuting that there is absence of the probandum, he still distinguishes it from an inference that proves directly that there is the probandum (*sādhana-anumāna*, TTD 139).]

The Nyāya does not agree that *tarka* should be accepted as a kind of inference that is a source of knowing (*pramāṇa*). Although *tarka* is based on pervasion, it involves a willfully made false assumption. For the Nyāya in an inference that is a source of knowing each premise must be true or reliable. Since *tarka* includes a premise that is false, it falls short of the norm of a source of knowing.

In the Nyāya view, *tarka* lends support to such a general proposition as that wherever there is smoke there is fire. It is given that this general proposition is confirmed by positive and negative examples and neither any counterexample nor any adjuncts have been found. The given general proposition serves as a representative of any other confirmed general proposition of its kind. It is consciously chosen for what is (or may be taken to be) backed by the required kind of observational evidence. It still has to meet the skeptical challenge. It is thus granted that the skeptical challenge cannot be met merely by adding more numerous and more varied observational data. [In other words, by way of comparison, the rules of Pascalian induction, the rules of Baconian induction or, for that matter, the rules of Mill's methods, even when fully implemented, cannot by themselves resolve the skeptical doubt.] This does not imply neglect of observation. On the contrary, the Nyāya emphasizes the value of repeated, intelligent and varied observation as well as the role of relevant hypotheses. Still, it is held that mere refinement and improvement of observational techniques will not answer the skeptic. If the skeptical challenge cannot be met in the given case, since it serves as a model of its kind, the challenge may very well remain unanswered. In that case, the *nyāya* that is prized as the paradigm of reasoning will lose a needed premise. [The structural affinity between the *nyāya* that dominates Indian (and Asian) logic and the categorical syllogism, that dominates traditional Western logic, is remarkable.]

Another counterfactual conditional for supporting the induction that all that is smoky is fiery is: if smoke were deviant from fire (i.e., belonged to a locus of absence of fire), it would not be an effect of fire (BP 771). Of the two counterfactual conditionals, viz., (1) if there were no fire, there would be no smoke and (2) if smoke were deviant from fire, it would not be an effect of fire, the former is described as subject matter–refining (*viṣaya-pariśodhaka*) and the latter as pervasion-supporting (*vyāpti-grāhaka*) (BP 771). The former is so called because it supports what is to be inferred, the subject matter of inference, by countering its negation. Thus it is argued that if there were no fire [in the yonder hills, say], there would have been no smoke [there]. Since the fire in the yonder hills is not observed, one could deny that fire is there. This supposition or hypothesis (*kalpanā*) that fire is not there, it is pointed out, conflicts with the observed fact that smoke is there. The latter conditional is so called because it is taken to lend support to the generalization directly (*sākṣāt*) by countering its negation while the former is taken to do so indirectly (*paramparayā*) (BP 771).

One significant difference between these two counterfactuals is that while the justification for the former would require an appeal to observation, the justification for the latter, given the Nyāya analysis of the concept of a causal condition, would not. For the claim that if there were no fire, there would be no smoke can be sustained only after the connection between smoke and fire has been learnt from observation. On the other hand, the claim that if smoke were deviant from fire, it would not be an effect of fire can be sustained simply on the ground that it is a part of the definition of a causal condition that the latter is an invariable (*niyata*) antecedent of the effect and, therefore, that anything that is deviant from something else cannot be an effect of the latter. This results from mental reflection (*mānasa-jñāna*) on the contents of the definition. It seems further that the justification of the former would eventually include an appeal to causation. The point is that even if smoke is observed regularly with fire without any exception, it cannot be claimed merely on that ground without begging the question that if there were no fire, there would be no smoke. The brunt of the skeptical critique is that such inductive reasons are no reasons. Hence the claim can be justified only by linking fire and smoke as cause and effect. This is why the latter counterfactual gets priority over the former, for the latter utilizes the causal connection explicitly.

Another counterfactual conditional, cited in the earlier passage from Gangesa, brought in defense of the said general proposition, is the following: if smoke were produced neither by an aggregate including fire nor by an aggregate excluding fire, it would not have been produced (TC 192).[4] For this counterfactual, too, like the second one, mental reflection is involved in seeing it as being conducive to truth, but not only because it exploits the concept of cause

(as does the second one), but also because of its logical structure [in the Nyāya terminology the latter is describable as a relation holding at the level of contentness (*viṣayatā*)]. If smoke [or anything] were to be produced, it must be produced either by a collocation of causal conditions including fire [something] or excluding fire [that thing]. These two alternatives are not collectively exhaustive but are mutually exclusive and both cannot be true. Thus the truth of this counterfactual depends in a significant way on the logical structure as well as general intuitions about the nature of causation.

In the above conditional, "smoke being produced neither by an aggregate including fire nor by an aggregate excluding fire" is the factitious supposition (*āpādaka*) and "smoke not being produced" the factitious consequence (*āpādya*). Since it is known that smoke is produced, the consequence part is false. The falsity of the consequence proves the falsity of the antecedent. Thus it follows that it is not the case that smoke is produced neither by an aggregate including fire nor by an aggregate excluding fire. In other words, it follows that smoke is produced either (a) by an aggregate including fire or (b) by an aggregate excluding fire. Since both the alternatives (a) and (b) are logically possible and also have factual contents, the choice between the two cannot be based on logic alone; we have to go beyond logic to the world of observation. Accordingly, the alternative that is favored by the data from observation is to be preferred. Gangesa has not explicitly stated this epistemic principle but it is without any doubt implied and useful for understanding his answer to the skeptical challenge to induction as well as for justification of empirical truths in general. Thus, it may be laid down as a general epistemic principle (favored by empiricism) that a factual claim that is backed by observation is preferable to one that is not. This may be called the principle of observational credibility—OC for short. [A similar empiricist principle is that a factual claim that has greater observational support is preferable to one that has less observational support. This could be called the principle of greater observational credibility—GOC for short. GOC is not needed in the present context.]

OC is a meta-principle presupposed in the acceptance of particular empirical claims as reliable (*prāmāṇika*). For example, suppose that I have to choose between two particular factual claims such as that this table is green and that this table is yellow. Suppose further that as I look at the table I see it as green and not as yellow. That provides me the basis to say that the table is green and not yellow and in the process I am implicitly relying on OC. Since OC is presupposed in accepting any particular empirical claims as reliable, OC is not an empirical induction—for that would amount to putting the cart before the horse. In the present context, the reliability of particular observations is not in dispute by Carvaka or Hume. Hence a general empiricist principle that is needed to make sense of the reliability of particular observations should also

not be in dispute. Needless to say, reliability of particular observations as well as empiricism as a whole may be challenged. But responding to such a challenge is not our task at hand. Our task is to respond to the Carvaka-like and also incidentally the Hume-like challenge to induction. Further, following Gangesa, our discussion is limited to only generalizations in which the pervaded is an effect and the pervader is a causal condition. It may be indeed possible to extend the discussion to other cases of generalization as well as to induction in a broader sense. But that is not our task here.

Given OC that is acceptable to both the Nyāya and empiricists in general, it follows that the first alternative (a), viz., that smoke is produced by an aggregate of causal conditions including fire, is true or reliable. This bestows favor (*anugraha*) on the induction that all smoky things are fiery. This follows from the definition of a causal condition. [Nyāya arguments for the causal law are briefly stated later.] A causal condition is defined in part as a constant condition. "Constancy" is needed to leave out accidental factors such as a donkey that may happen to be present where an effect like smoke is produced and is not a causal condition. Given this definition, that all smoky things are fiery is true or reliable (*prāmāṇika*).

This argument, it may be noted, implicitly makes use of the rule of double negation, the De Morgan rule, the rule of disjunctive syllogism, and the rule of *modus tollens*. The argument may be reformulated and the formal structure explained as below. Let *p* symbolize "smoke is produced by an aggregate including fire," let *q* symbolize "smoke is produced by an aggregate excluding fire" and let *r* symbolize "smoke is produced."

	1. $(\sim p \ \& \sim q) \supset \sim r$	
But	2. $\sim\sim r$	
Therefore	$\sim(\sim p \ \& \sim q)$	(*modus tollens*)
Therefore	$\sim\sim p \vee \sim\sim q$	(De Morgan)
Therefore	$p \vee q$	(double negation)
But also	3. $\sim q$	
Therefore	p	(disjunctive syllogism)

The formal part of this argument also is of historical interest. These Sanskrit works belong to a period long before the rise of modern logic. In that period similar logical acumen making implicit use of the De Morgan law in particular is missing in other logical traditions of the world.[5]

It is clear that in arguing for the reliability of induction Gangesa has implicitly relied on some logical laws and an epistemic principle called OC. Needless to say, even the logical laws are not above challenge; still, they are as safe as it gets in the world of philosophy. They are also not rejected by either Carvaka

or Hume. So far as OC goes, neither Carvaka nor Hume should disown it. Carvaka challenges the rationality of inductive leap but holds that particular observations may be reliable and are the only sources of knowing (*pratyakṣaikapramāṇavāda*). Hume also questions if any reason can be given for induction but holds that (impressions and) observations of particulars are the foundations of all knowing. Neither position may be sustainable without OC. So the argument of Gangesa is right on the target.

Another way of seeing the point following Bhavananda is that the skeptical supposition that smoke is sometimes caused by something other than fire is uneconomical (*prayojakāntara-kalpane . . . gauravāt*, TCDP 600). The lack of economy is based on cognitive link (*upasthiti*). That is, of two suppositions the one with a closer link to something known is to be preferred. Since smoke is observed to arise where there is fire, the supposition that smoke is sometimes caused by something other than fire is more removed from what is observed than that smoke is caused by fire. Thus the rejection of skeptical doubt need not be based on animal faith or instinct but could be based on a principle of reason such as OC or even the law of parsimony.

It may be noted that one point of exploring these counterfactuals seems to be that these help to show a degree of continuity and affinity between (by borrowing modern terminology) deduction and induction. [From a typical Indian point of view the distinction between *nigamana*—or extracting what is implied from something given—and *āgamana*, *vyāptigraha*—or moving from the particular to the general, as also between what is *para* or independent of experience and *apara* or dependent on experience—must be drawn. But that does not warrant the conclusion that any given knowledge claim is exclusively deductive or inductive or *a priori* or *a posteriori*. Nothing here should of course be taken to suggest that the relevant Indian and Western concepts are quite the same.] Although some passages taken out of context may suggest otherwise, the Nyāya logicians have never tried to show that induction is at bottom deductive (as Aristotle is alleged to have done) or replace induction with the hypothetico-deductive model (like Karl Popper) or defend induction on purely *a priori* necessitarian grounds (like early Pierce and D. C. Williams). But the skeptic presumably does not dismiss deduction as irrational and is not also begging the question and equating openly rationality with deducibility. [If the skeptic does claim that being rational is synonymous with being deducible, no meaningful debate, from the Nyāya point of view, is possible, for induction is, admittedly, not formally valid. In other words, in order to have a meaningful debate, it must be possible for the inductionist to show that induction is rational without having to reduce it to a valid deduction.] From this point of view the above discussion is relevant. What that shows is that our run-of-the-mill general propositions have counterfactual implications the

truth of which depends in a significant way on their logical structure (or, in the Nyāya terminology, is discernible [partly] by mental reflection and [significantly] dependent on the relation within contentness). Deduction and induction then are not diametrically opposed, as it may appear in the beginning, but are analogous and kindred in an important way. Because of the analogy and kinship the inductionist may now plausibly claim that induction too is a rightful candidate for being rational.

The skeptic may retort that arguing analogically falls short of demonstrative proof and amounts to having recourse to a species of induction to vindicate induction. But Nyāya logicians would refuse to fall into the trap of having to prove rationality of induction deductively on purely noninductive ground. That is an impossible task. If that is what the skeptic dogmatically insists on, there can be no real debate, as already said, for there is not enough common turf and, therefore, not enough room for resolving the differences.

For a better understanding of what is at stake here, let us think of the scenario where a conservative and a liberal try to discuss and resolve their differences over cultural diversity. It may soon transpire that the conservative has already made up his mind about defining culture through certain criteria, say *a*, *b* and *c*, which apply only to his chosen model. On the other hand, the liberal does accept *a*, *b* and *c* as cultural criteria but also adds certain others, say *d*, *e* and *f*, which are somewhat analogous but still significantly different from *a*, *b* and *c*. The liberal may try to persuade the conservative that something (say, with the features *a*, *b* and *d*) other than the latter's chosen model should also be accepted as (an advanced) culture and the latter may try to persuade the former that it should not be so accepted. But assuming that both will stick to their positions, this is a dispute that cannot be fruitfully resolved. Similarly, the dispute over induction cannot be fruitfully resolved if the skeptic has already conceived rationality in such a way as to fit only deduction and the inductionist flatly asserts that inductive reasons are rational in their own right.

One of course assumes for the health of philosophy that both are willing to reconsider their positions and continue the debate. But that would require fulfilling at least two conditions. The skeptic must refrain from assuming that deducibility and rationality always go together and allow, at least provisionally, the inductionist to bring in some nondeductive considerations to make it possible to show that induction is rational. The inductionist too must allow the skeptic to show why induction is still irrational on such grounds as circularity. It is in this spirit that the Nyāya logicians appear to stay in the debate.

Nyāya logicians are not claiming that it is rational to infer directly from the way the world was or is to the way the world will be. They agree with the skeptics [and this shows how close they are to skepticism and what a major concession they have made without being skeptics] on the following: the fact

that smoke has always followed fire in the observed past or present does not by itself give the rational ground to infer that it will be so tomorrow, or that it will not be so tomorrow. Thus external experience alone does not provide such a ground although for knowledge of external things the mind (more accurately, the inner sense: *manas*) is totally dependent on the external senses [in modern terms, there are no *a priori* connections in the realm of experience]. They also agree that the ground requires the office of mental reflection (*mānasa-jñāna*).

Since no direct inference from experience to the future is justified, either the skeptic wins or some indirect way must be found. Accordingly, they introduce the counterfactual reasoning for the latter purpose. This deals with counterfactuals and with what would have been. This is not surprising, for our beliefs about the future are not merely beliefs about what will actually happen in the future. They also include beliefs about what would have or could have happened. For example, "whoever jumps off a tall building (and crash lands without protection), dies" includes the belief that if I were to do that I would meet the same fate. This is why I do not do that and make sure to the best I can that it does not happen. This is more patent for general statements that are, by borrowing modern terminology, vacuously true. For example, consider: "an eternal entity that is independently productive is productive for ever." Nyāya philosophers accept this, although there are, in their view, no eternal entities that are independently productive. This still makes sense, for what is implied is that if there were to be any such thing it would have been so. [One may, if one wishes, change the example to something more modern: for example (Newton's First Law) that if no force is exerted on a body, its acceleration is zero.] Further, and equally importantly, what would have been is not what was or is or will be. What was or is or will be belongs to the real world, what would have been does not. [Nyāya philosophers do not subscribe to the realism of possible worlds as David Lewis and others do.] The counterfactual situation, by definition, will not be realized and observed. Since we are not dealing with future external events about which the mind must learn from the external senses when the event will take place and since all relevant information is already available, the world of what would have been is a realm where the mind has its legitimate sway. Thus, by resorting to counterfactual reasoning and exploring what would have been, Nyāya philosophers seek to justify the claim about what will be and about all unobserved cases.

An accidental and false generalization does not hold up when we explore its modal character and try to support it by counterfactual reasoning. Consider: wherever there is fire there is smoke. Suppose that we argue like this: if there were no smoke, there would have been no fire. This is patently falsified by the counterexample of a red hot iron ball where we see that there is fire but no

smoke. But consider: wherever there is smoke there is fire. It does hold up when we explore it subjunctively. This then is a significant difference between the two generalizations that is brought to light by probing counterfactually. The counterfactuality is conveyed by the formulation of the *tarka* in the subjunctive mood and the explicit labeling of both the antecedent and the consequent of the conditional as factitious.

The skeptic could retort: how do we know that there is a significant difference? He might argue that using counterfactual language does not really change anything. The difference between "If there were no smoke, there would have been no fire" and "If there were no fire, there would have been no smoke" is equivalent to, he might say, the difference between a straightforward causal statement that has known counterexamples and one that does not.

But such a retort would from the Nyāya point of view overlook the peculiar nature of counterfactuals. Since counterfactuals deal with what would have been and since the latter is not a part of the real world, the realm of what would have been, as said, can be justifiably explored by the mind. This has been brought out earlier by the exploration of the counterfactual argument that if smoke were produced neither by an aggregate including fire nor by an aggregate excluding fire, it would not have been produced. Thus the difference in the epistemic values of the two above counterfactuals is shown through mental reflection. [The recognition of this role of mental reflection does not in any way compromise the basic empiricist position that the mind is totally dependent on the external senses for information about the external world.]

Again, if one questions the above generalization, one must also question that smoke is caused by fire and invariably preceded by the latter. Then one should suppose further that possibly smoke is produced by an aggregate of causal conditions that does not include fire. But such a supposition is no more than a mere speculation and has no empirical evidence to back it up. It is thus no better than such an idle speculation as that possibly there are crows having teeth. This latter supposition is not self-contradictory and is logically possible. Nevertheless, there is nothing in what we have observed about crows and teeth that gives the slightest credence to the supposition. Similarly, although it is logically possible that smoke is sometimes produced by a sum total of causal conditions that excludes fire, there is nothing in our observation of smoke and fire that supports such actually being the case. [Further, the supposition is uneconomical due to a relative lack of a cognitive link (*upasthiti*) compared to that smoke is caused by fire.]

Thus, by exploring the consequences of the skeptical doubt about induction, it is shown to involve claims about possibly observable situations that are empirically baseless as well as uneconomical. Factual possibilities in the external world are determined not merely by *a priori* speculation but also, additionally

and more importantly, by observations of what there is. [This is a corollary of OC.] Under the circumstances, a skeptic who would persist with the possibility of inductive deviation is no better than someone who would persist with the possibility of examining, say, the teeth of crows and only deserves to be ignored (*upekṣanīya*). This does not show that skepticism about induction is logically impossible. [We have already said that Nyāya philosophers are not up to that, which, incidentally, shows their difference from analytical rationalists like Strawson or Ayer.] Still it shows that such skeptics do not qualify either as commoners (*laukika*) or as experts (*parīkṣaka*) whose opinions are, to the Nyāya, the prime sources of philosophical material. A philosopher is entitled to evaluate common as well as expert opinions. But the results of his evaluation must find acceptance among commoners or experts. Otherwise, if a philosopher does not exercise some judgment and attaches an equal weight to any and every opinion (such as that possibly crows have teeth, or that this thing which everybody else in the room says is a table, is not a table but an elephant), he cannot even get started. Accordingly, if the skeptic's (empirically baseless) opinion about the possibility of deviation fails to coincide with either common opinion or expert opinion, it only deserves to be rejected.

Needless to say, the inductive claim about all cases (observed and unobserved), though justifiable, is also falsifiable and would remain so. Gangesa and other Nyāya philosophers are very clear on this. But that is very far from saying that the skeptical doubt about induction is justified. As the exploration of counterfactual conditionals shows, the skeptical doubt involves claims about possibly observable situations that are empirically baseless and uneconomical and, therefore, unjustified.

The skeptic could again try the old rejoinder that the above proves only that there are as yet no known counterexamples to some inductions. He could reiterate that the inductionist is still committed to assuming that the future will be like the past and insist that observations about what is tells us nothing about what will be. Thus the skeptical doubts are no more empirically baseless or unjustified, he could say, than the inductionist's claim to knowledge.

But such a defense for the Nyāya would amount to conveniently bypassing the points made by the inductionist above without trying to meet them. Since the observations about what is, for the skeptic, tell us nothing rationally about what will be, the skeptical claim about possible unobserved counterexamples is a claim about an observable situation, which claim is merely speculative. But the inductionist is neither indulging in assuming that the future will be like the past nor merely speculating about what the future holds for us. Instead he is basing his claim about the future on the mental exploration of what would have been as brought about by the counterfactual argument. Thus, while the inductionist is able to utilize the crucial bridge of what would have

been between what is and what will be, the skeptic is unable to do so. Since the latter's claims about future observable situations cannot be justifiably based on merely claims about what is logically possible, the latter's position seems to be significantly weaker than that of the inductionist.

Nyāya philosophers emphasize that an exploration of the law of causation is useful for a resolution of the problem of induction. Thus Raghunatha says: "Knowledge of the cause-effect relation, too, must be investigated, for knowledge of pervasion is dependent on that" (GD 680). He says further:

> When one sees the co-presence and co-absence of smoke with the aggregate including fire, donkeys, etc., one comes to the conclusion that one of these must be the cause of smoke. . . . There of those belonging to the aggregate that without which smoke is found to be produced is ascertained not to be the cause, such as the donkeys. That without which smoke is found not to be produced in spite of the presence of all the others in the aggregate is ascertained to be the cause, such as fire. (GD 676)

As already said, the smoke-fire case serves as a paradigm and "smoke" and "fire" play the roles of quasi-variables with smoke representing any effect of its kind and fire any cause of its kind. Using the paradigm Raghunatha is in so many words recommending the joint method of agreement and difference for the purpose of eliminating connections that are accidental, such as that between smoke and donkey, and for finding connections that are causal, such as that between smoke and fire. [This is of historical importance considering that Raghunatha (fifteenth century) is long before Mill and also before Bacon. Raghunatha is probably the first philosopher to have stated the joint method explicitly. It remains true, of course, that anticipations of the methods of agreement (*anvaya*, *sādharmya*) and difference (*vyatireka*, *vaidharmya*) are found in Indian writings (as well as Western writings) from early times.] He points out that in every observed case where smoke is produced, fire is included in the collocation of things immediately preceding it. Thus fire is a uniformly common factor in each such collocation (agreement in presence). Further, in every observed case where smoke is not produced in spite of the presence of all other factors in the collocation, fire is found to be absent (agreement in absence). This establishes fire as a cause of smoke. Once fire is known to be a cause of smoke, the suspicion that smoke may deviate from fire in unobserved cases is removed. Gadadhara has observed:

> Being an effect is opposed to being deviant. . . . Cognition of being an effect removes the apprehension of deviation by way of putting forth the counterfactual argument (*tarka*) that if smoke were deviant from fire, it would not have been a product of fire. (GD 681)

The Nyāya thus has been drawn into defending the causal relationship against skeptical onslaughts. Since, however, this is a large topic in its own right and would require a great deal of space even for a preliminary discussion, we shall look at it very briefly and only in outline (though we do summarily present some powerful Nyāya arguments for upholding causality below). The Nyāya philosophers have argued at great length to try to show that such views as that things originate without any cause (*ahetuka*) or that things come into being merely by chance (*ākasmika*) or that the origin of things can be explained merely by an appeal to their own nature (*svabhāva*) do not survive sustained and tenacious philosophical criticism. They also reject after a prolonged examination the Sāmkhya view (somewhat similar to Aristotle's view) that there is an essential identity and continuity between the cause and the effect so that the latter is potentially contained in the former. They are further averse to the idea that a cause has the power (*śakti*) to produce the effect. The Mīmāmsā philosopher Kumarila Bhatta has championed the doctrine of causal power (a similar view is held by Locke); the Nyāya has subjected it to a detailed and careful examination and refutation.

In defending causality the Nyāya is not subscribing to a necessitarian view of nature (shared with some differences by both Platonists and Aristotelians) that has dominated traditional Western philosophy. From the latter point of view cause and reason are very closely linked. Knowledge is of first principles and what is deduced from them. Hence *scientia*, according to medieval scholastics, must get at the essence of things and proceed by the demonstration of effects from first causes. But the influence of this view by no means ended with medieval scholastic philosophy. Even Bacon, the father of Western inductive logic, held that knowledge is derived from common notions and that we seek true axioms and real notions that eventually produce knowledge and not opinion. Descartes tried to demonstrate the laws of planetary motions, the laws of refraction of light and even that the blood must be red. For Leibniz there is a sufficient reason for any truth and it can be proven *a priori*. Scientists of this period aspired for demonstrative knowledge of primary qualities although they could perform experiments only on secondary qualities. Causes were thought to be the domain of respected sciences like optics, astronomy or mechanics where demonstration seemed to be achievable. Inferior sciences like geology or medicine had to be content only with signs that relied on observed association without backing of demonstration.

The wedge between knowledge and opinion was retained by Hume, for whom knowledge was confined to mathematics and the like and evidence short of deduction, like the medieval thinkers, was not really evidence at all. Knowledge was still of first principles in a sense and what can be demonstrated from them. Only no scholastic causes and necessary connections were

to be found in nature, as Robert Boyle and company were persistently driving home. The way out was to dissolve the longstanding marriage between cause and reason. This Hume did and in the process collapsed the division between cause and sign. Causes exhibiting nothing more than regular association could not to be closeted with reasons and, therefore, had to be closeted with signs. In other words, demonstrative knowledge advertising *a priori* reasons on the one hand and irrational opinion smuggling in associative signs on the other were the only choices. Since the first was ruled out for causes, the second had to be the case.

There is much in Hume's crusade against *a priori* necessities in nature that the Nyāya would share. There are no logically necessary connections between causes and effects for Hume; the Nyāya does not dispute that. The latter too argues, against the Sāmkhya, that cause and effect are distinct existences and would agree with Hume that the ideas of a cause and its effect are distinct, so that a particular cause is always conceivable without its effect, and a particular effect without its cause. Thus the drive to get at the *a priori* essences of natural phenomena and proceed by the demonstration of effects from the first causes is foreign to the Nyāya thought. The latter further agrees that all that is observed for causation is constant conjunction and dismisses causal power. Thus there is no power that if we found it in a cause would tell us at once that the cause would bring about the effect. There is also agreement between the Nyāya and Hume on the foundational role of causation for inferences concerning matters of fact.

But the Nyāya would not give a psychological explanation for causation and conclude like Hume that causality is only in the mind. Although regular succession is what we observe and there is no causal power, causation is still objective and not projected by the mind onto things. The Nyāya would also disagree that the experience of constant conjunction does not provide materials for any rational inference from cause to effect (or vice versa) in a new instance.

Why this difference between the Nyāya and Hume? One main reason is that the former does not regard demonstrative knowledge and irrational opinion as the only choices, a vestige of scholasticism in Hume. The former also thinks that deduction is only one way of giving reasons and does not hold that evidence falling short of deduction is no evidence at all.

What are [while looking at it very briefly] some of the Nyāya reasons for upholding causation? First, causal and accidental connections are separable by exploring the corresponding counterfactual conditionals. Thus, if smoke is claimed to be caused by donkeys, the corresponding conditional is: if there were no donkeys, there would be no smoke. When we observe in a kitchen that there is smoke but no donkeys, the conditional is found to have a true

antecedent but a false consequent. This is never the case when the connection is causal. Thus when a counterfactual conditional is found *not* to have a true antecedent and a false consequent, it is accepted as being conducive (*anugrāhaka*) to truth. Nyāya philosophers do not claim such a conditional to be true. Still its epistemic value must be different from some other conditional that has a true antecedent and a false consequent. The difference in the epistemic values of the two sorts of conditionals provides a ground for separating causal from accidental connections.

[Further: (1) Nyāya philosophers have added absence of obstruction as a general causal condition. (2) While each causal condition is regarded as a necessary (*niyata*) condition, Nyāya philosophers regard the sum total of causal conditions as the sufficient (*phalāyogavyavacchinna*) condition. (This notion of a causal aggregate (*kāraṇa-sāmagrī*) is similar to that of a causal field introduced by John Anderson to resolve difficulties in Mill's account of causation.)[6] (3) They distinguish between triggering (*phalopadhāyaka*) causes and predisposing (*svarūpayogya*) causes. (4) They elaborately study causal irrelevance (*anyathāsiddhatva*). While discussing these is beyond the scope of our inquiry, one hopes that various difficulties that may crop up in the course of the conditional analysis may be resolved in the light of these.]

Second, the observed fact of the occasional nature (*kādācitkatva*) of the effect (i.e., that the effect is produced only on the occasion the cause is there) points to the dependence (*sāpekṣatva*) of the former on the latter, which in its turn, points to causation.[7] While other explanations are not logically impossible, no other explanation in the Nyāya view gives more economy (*kalpanā-lāghava*) or does a better job. The inference from occasionality to causality is justified, because no better explanation is available (*ananya-gatikatayā*: literally, "because there is no other reasonable *gati* or explanation"). In particular, as Udayana argues, if the effect is not dependent for its origin on the causal condition, why does it not come into being anywhere and anytime (NK 1.4 and 1.5)? Effects do not happen at all places and all times. They happen only at particular places and particular times. These particular places and times are where and when certain conditions are fulfilled. These conditions put limits (*avadhi*) to the possible places and times for such happenings and such limits are constant (*niyata*). There are no effects that happen anywhere and anytime: it is impossible for an effect to happen anywhere and anytime.

An effect is that which comes into being and was nonexistent before (*prāgabhāva-pratiyogin*). It follows necessarily that there are times and places when and where the effect is nonexistent. The nonexistence comes to an end only under certain conditions that accordingly provide the limits to the possible times and places for the thing's existence. Without such limits the effect could exist anywhere and anytime and could not be an effect: something that

exists anywhere and anytime (*sadātana*) is not an effect. Thus the occasional nature of effects cannot be explained without the acceptance of limits and that is tantamount to the acceptance of causal conditions. In other words, occasionality presupposes limits and limits are nothing other than causal conditions. This defense of causality seems to be satisfactory and no sound rebuttal from the skeptic seems to be available.

An important part of the concept of causation is that effects depend on their causes. Nyāya philosophers often express this dependence in terms of counterfactual conditionals. Since the causal condition is a constant antecedent (*niyata-pūrvavṛtti*), if *f* is a causal condition of *s*, *s* would not have taken place if *f* had not taken place (*tat-asatte tat-asattā*). Such counterfactual analysis seems to be natural and has been adopted by some contemporary philosophers just as it has been criticized as well. (See, for example, G. Bjornsson, "How Effects Depend on Their Causes," *Philosophical Studies*, 133/3, 2007). It is remarkable that such criticism has been implicitly anticipated and addressed by Nyāya philosophers by making subtle distinctions. Due to the limitation of space we cannot discuss the issues in detail but shall mention only one point. Suppose that two archers shoot arrows at the same prey and one arrow hits the prey first and kills it. Had not the first arrow killed the prey, the second arrow would have killed it. Nyāya philosophers have distinguished between the two arrows by calling the first a triggering or immediately productive causal condition (*phala-upadhāyaka-kāraṇa*) and the latter a predisposed or inherently capable causal condition (*svarūpa-yogya-kāraṇa*). In this way, if we dig deep, we may find, though no philosophical position may be above criticism, an adequate defense of causation in the Nyāya.

The Nyāya has argued in part against a skeptic like Carvaka; but the argument could also be extended to a skeptic like Hume or anyone who would not leave the origin of things to causes but to chance. The point may be brought further out as follows. While leaving to chance is logically possible, how does that throw any additional light on the matter? The only explanation that such a skeptic has at his disposal is that anything or everything happens by chance. Why does the flower bloom? Because of chance. Why does water flow downward? Because of chance. Why do people get malaria? Because of chance. Such a skeptic fares no better than a theist who would leave anything and everything indiscriminately to God. Why does the flower bloom? Because of God's will. Why does water flow downward? Because of God's will. Why do people get malaria? Because of God's will. All that such a skeptic thus has done is to replace God's will with chance. The irony of the whole thing is that while such skeptics dismiss the theists as dogmatists (historically both Hume and Carvaka have rejected theism as dogmatism) and the theists dismiss the skeptics as charlatans, neither may fare any better than the other. While both the ap-

peal to chance and the appeal to God are logically possible, neither has any additional explanatory value when the same old explanation is offered for anything and everything.[8] By contrast, assigning different causal conditions for different effects gives us the needed order and control over the virtually endless empirical data: such order and control is the hallmark of rational inquiry. Accordingly, a causal explanation is preferable to an appeal to chance.

A skeptic may not advocate chance in all cases and may accept causation in observed cases and allow chance in some future cases. The skeptic then could appear to avoid the above difficulty. Still, such a skeptic would be hard put to explain why the effect produced by chance in future is of the same kind as the effect now (*kāryaikajātīyatvānupapattih*). Clearly, that they are of the same kind cannot be due to having the same kind of cause. That would violate the skeptic's claim that the future effect is due to chance. So the only consistent position for the skeptic is to say that they are of the same kind due to chance. But if being of the same kind is left to chance, how does that throw any additional light (apart from being logically possible) on the question about why they are of the same kind? A little reflection then shows that the old difficulty in the above view crops up in the present view as well. Indeed, if being of the same kind is due to chance, why allow causation at all? That is, what is the difference between cases of chance and cases of causation that makes it necessary to say that while the former is due to chance the latter is not? Further, if someone challenges the claim that the present effect caused by something and the future effect due to chance are of the same kind, the skeptic does not have the resources to answer the challenge. That is, the skeptic cannot produce any cogent reason to show that they are of the same kind. Under the circumstances, the skeptic's claim that the future effect produced by chance is of the same kind as the present effect is an idle speculative factual claim that may have nothing but being merely logically possible to recommend for it.

The critic may, again, complain that nondeductive reasons have been introduced to defend causation and, thereby, induction. If so, Nyāya philosophers would plead guilty to the charge (*iṣṭāpatti*). What justifies the introduction of such nondeductive reasons, of course, is that no better explanation is available. This does not amount to begging the question, for the Nyāya claim is based in part on showing that rival explanations fare worse than that provided by the acceptance of causation.

It may be added that Hume's psychological explanation of causation is inadequate for the purpose. It may be readily granted that the repeated observation of contiguity of two things could produce, as Hume suggests, the habitual expectation of those two being causally connected. But this does not address the prior and more fundamental question raised by the Nyāya. The Nyāya does not ask about what could result from the repeated observation of conti-

guity, but about what could provide an explanation of the repeated observation of contiguity itself. The question, to repeat, is: why is one thing, say, smoke, never found to come into being without the presence of another thing, say, fire? The best available explanation, the Nyāya claims, is that the presence of one is required for the origin of the other—which points to causation.

A number of considerations may go into determining why one explanation is better than another. One obvious consideration is whether the explanation can be tied to a general truth. For example, the hypothesis (*kalpanā*, *arthāpatti*) that a particular person who is fat and does not eat during the day, eats, though unobserved, at night becomes reliable (*prāmāṇika*) if it is true in general that whoever is fat and does not eat during the day eats at night (BPP 552–53). The facts in the situation present an incongruity: the person is fat and yet does not eat during the day. The hypothesis is offered to resolve the incongruity. The general proposition offers an explanation of why the hypothesis holds in the particular case. With it added as a premise the hypothesis may be validly deduced as follows: "Whoever is fat and does not eat during the day eats at night. [The wider general truth lending support to this premise, as it is pointed out, of course is that no one can stay fat without eating. The process of finding more and more general truths will eventually lead to the fundamentals of the system.] Rabi is fat and does not eat during the day. Hence he eats at night." Thus a hypothesis that is validly derivable by adding an accepted general law as a premise is reliable as opposed to another (such as that Rabi has spiritual power and can get nutrition without eating) that is not.

Another consideration is to apply one or more of the three basic laws of economy (or simplicity: *lāghava*), viz., economy in cognitive link or order (*upasthiti*), economy in relationship (*sambandha*) and economy in constitution (*śarīra*). The first enjoins the following. Of two necessary antecedents (or two equally matched hypotheses) the one that is more directly related to the effect (or the explanandum) in the cognitive order is more economical. For example, when the smell of a mango changes its color too changes. Thus prior absence of the new smell and prior absence of the new color are both necessary conditions of the changing smell; but only the former and not the latter is accepted as a causal condition of the new smell, for that is more directly related to the effect in the cognitive order. In other words, previous absence of something is more immediately relevant than previous absence of something else as an explanation for the origin of something and should be recognized accordingly.

The second is as follows. Of two necessary antecedents (or equally matched hypotheses) the one that is more directly related to the effect (or the explanandum) is more economical. For example, a wheel is accepted as a causal condition of a pot but not wheelness (the common feature of all wheels) although

both are necessary antecedents, for the latter's relation to the pot is established through the former and, therefore, is more indirect.

The third law implies that of two necessary antecedents (or equally matched hypotheses) the one that is analyzable into fewer constituents is preferable. For example, for a substance to be perceptible (in the Nyāya view) it should have intermediate magnitude (that is neither the biggest nor the smallest possible magnitude) and should also be made of many substances. Although both are necessary conditions, only the former is accepted as a causal condition of perception of a substance on the ground of economy of constitution. These principles of simplicity do not imply that in the Nyāya view the world is simple. On the contrary, the favorite ontology (that the Nyāya has adapted from the Vaiśeṣika) is highly structured and elaborately worked out to the minutest detail. But it does mean that a theory or an explanation that is unnecessarily complex is inferior, other things being equal, to another that is not so. This follows from the very nature of a theory or explanation one purpose of which is to give a clearer understanding. If no cap is put on avoidable complexities, the explanation could be indefinitely long and hinder rather than contribute to a clearer understanding.

Besides the basic principles of economy there are also numerous auxiliary ramifications. One ramification is that, other things being equal, an explanation that conflicts with fewer observations (or accepted truths) is preferable to one that conflicts with more. Thus in SL (58) a theory conflicting (*apalapa*) with two experiences (*anubhava*) is found to be at a disadvantage compared to another theory conflicting with only one experience. The other side of this is that, other things being equal, an explanation that applies to a greater number of relevant situations is preferable to one that applies to a fewer number of relevant situations (BPP 36). Another ramification is that an explanation that is equally matched (*tulyabala*) by a rival explanation is not reliable (NS 1.2.7). Yet another ramification is that an explanation that relies on mere (random) similarity (*sādharmyamātra*) or mere (random) dissimilarity (*vaidharmyamātra*) is not reliable (NS 5.1.2). Still another ramification is that an explanation that leads to the addition of something unfavorable (*utkarṣasama*) or the deletion of something favorable (*apakarṣasama*) is not reliable (NS 5.1.4). Indeed, inference to the best explanation (*ananyagati*, *anyathānupapatti*, *prayojakakalpanā*) is a well developed and widely used technique in Nyāya logic.

Returning to causation, a skeptic may not dispute that there is causation in particular cases. [For Hume's "rules by which to judge of causes and effects," see *Treatise*, I, iii, 15; Selby-Bigge 173–74.] For example, when I light up fire and see something being burnt and smoke coming out, I know (after removing superfluous factors, if appropriate) that smoke is caused by (an aggregate including) fire here and the skeptic may accept that. [If the latter disagrees, it

suffices to point out that general skepticism about particular observations is not the subject of discussion here and is out of place. Our concern here, as already said, is to see if induction is justified assuming that particular observations are true or reliable.] The skeptic, of course, claims that this and other such additional observations do not give us a rational ground for thinking that smoke will be caused by fire in a new case or that smoke is caused by fire in all cases. Still he does not dispute that smoke is an effect, is caused by something and is caused by fire in the observed cases. But then in order to be able to question that smoke will be caused by fire in new cases, the critic must court the doctrine of plurality of causes. Thus one possible skeptical challenge to the above solution comes from the doctrine of plurality of causes. This is the doctrine that the same effect may be produced by more than one sum total of causal conditions. For example, death may be caused by drowning, taking poison, starvation and so on. Fire may be fueled by grass, wood, coal and so on. Could it then be that although smoke is produced by an aggregate that includes fire, it may also be produced by an aggregate that excludes fire but includes something else?

The doctrine of plurality of causes, however, has been examined and rejected by Nyāya philosophers like Udayana. Briefly stated the Nyāya position is that the so-called cases of plurality of causes boil down upon careful scrutiny to one of two situations. The seemingly different causal aggregates may be found to have common traits so that they can all be said to be of the same kind. For example, all cases of death from drowning, poisoning and so forth. may be found to involve the common factor of stoppage of flow of oxygen to the brain and this may justify the conclusion that all cases of death are caused by the same kind of cause. Alternatively, the seemingly same effects may be found, when closely examined, to have significantly different features so that they can be said to be of different kinds. For example, fires fueled by different kinds of materials burn differently. Some fires burn for a short time and some for long. Some produce more heat and some less. Some produce more light and some less. All these may justify the conclusion that these are different kinds of fire caused by different kinds of causes. So, either the seemingly different effects are found upon examination to have a common nature and then the seemingly different causal aggregates are also found to have a common nature or the seemingly same effects are found to have different natures and then they are also found to be caused by things of different natures. Thus, the admission of plurality of causes can be avoided either by showing that the effects are of different kinds (*kārya-vaijātya*) or by showing that what appear to be different kinds of causes have a common nature (*kāraṇaikajātīyatva*).[9] If the above reasoning is sound, the skeptical objection from possibility of plurality of causes fails.

Another possible skeptical challenge comes from the doctrine of accidentalism (*āksmikatāvadā*) that things either routinely or at least sometimes happen by chance. If this is accepted, it cannot be claimed that, say, smoke is invariably caused by an aggregate that includes fire, for at least accidentally it may be caused by an aggregate that excludes fire.

The doctrine of accidentalism too has been examined and rejected by Nyāya philosophers like Udayana as already noted. In brief, the Nyāya position is that there are no accidents in nature. The so-called cases of accident show upon examination uniform causal connections with common effects and common causes. For example, one may be said to have died accidentally from drowning. But then the usual causal connections were surely not violated in such a case. That is, one who died did get into water, did not stay afloat, got submerged in the water, could not breathe after being submerged and consequently died. It may be thought perhaps that the one who died from drowning still got into water accidentally, such as that he/she may have been leaning on the railings of the deck of a ship, the railings suddenly gave away and he/she fell into the water, did not know how to swim and drowned. But even then no causal laws were breached. Perhaps what happened was that the railings were in disrepair and rusted and the man's weight was too much for those railings to bear. Indeed, the search and discovery of causal connections where such connections are not apparent is one of the foundations of scientific inquiry.

But where is the evidence, the skeptic may persist, for this fundamental principle that causal laws are universal and uniform? If this evidence is merely from observation of every known case of an apparently accidental happening as being eventually tied to accepted causes, it presupposes the rationality of induction and, in the present context of justification of induction, is circular. So Udayana gives a different answer: the evidence comes from the occasional (*kādācitka*) nature of effects as said before. Occasionality is best explained by admission of limits that point to causation and disfavor accidentalism. The skeptic's challenge from the standpoint of accidentalism seems then to fail.

Further, in order to argue for the plurality of causes the skeptic has to show that the different cases of death are all of the same kind (and not merely similar). Now, the notion of being of the same kind, the Nyāya philosophers argue, cannot be ultimately defended without the admission of universals (*jāti*). This is, again, a large and difficult topic in itself and cannot be fully discussed here. Still we note here that Nyāya universals are not transcendent ideal exemplars like the Platonic forms, but are (sometimes observable) common characters inherent in the particulars and that both particulars and universals are real [a loose Western analogue is David Armstrong's theory of universals]. A key Nyāya argument for this is as follows. We speak of natural

classes like lions, tigers and so on. We put all lions into the same class for a reason. The reason is that individual lions are found to share a family of similar features. Similar features are particular features. But particularity itself is not the basis of similarity, for then any two particular things could be similar. So some other basis for similarity is needed. If that basis is something particular, the same question about what makes that similar comes back and continues infinitely as long as only something particular is offered as an answer. Since infinite regress can be avoided only by admitting nonparticular identical features shared by different particulars, these should be admitted as real. Such identities called universals are needed not only for class inclusion but also for class exclusion. We not only put all lions, for example, into the same class, but we also exclude all tigers from that class. The reason for that is that tigers do not share the same features. Since once again similarity without identity will generate infinite regress, universals are needed to make sense of class exclusion as well.[10] Though Nyāya philosophers accept universals, they do not subscribe to either the older Platonic essentialism or the recent new essentialism of Kripke, Putnam and so on. (For a brief account of new essentialism and criticism see S. Mumford, "Kinds, Essences, Powers," *Ratio* (new series) XVIII 4, 2005, 420–36.) Nevertheless, the Nyāya supports natural kinds as corollaries of universals.

But if universals are admitted, why not admit causation and induction as well? For then the unobserved cases could be viewed as being of the same kind as the observed cases and causation and induction upheld accordingly.

The appeal to causation may invite the old and familiar charge of circularity. Since pervasion (induction) presupposes causation and causation presupposes pervasion (induction), no real progress, the critic might say, has been made. Hume, in particular, argues as follows. The reason for moving from observed to unobserved cases would have to rely on the principle of uniformity of nature that unobserved instances resemble observed ones. But this principle is not necessarily true, for its denial is not self-contradictory. It cannot also be shown to be probable, for any such attempt would have to rest on the very presumption of the principle of uniformity—which would be circular.

All this makes sense only if it is assumed that nothing falling short of a valid deduction constitutes a reason or a rational exercise, an assumption that the Nyāya does not buy. In particular, the principle of uniformity must be presumed as a premise while showing that induction is reliable only if such showing must be a deductively valid argument. But clearly, the Nyāya has not tried any such thing. Hence they are not obligated to presume or add as a premise the law of uniformity while arguing for rationality of induction. On the contrary, the Nyāya has offered counterfactual reasoning to argue for the reliability of induction. The principle of uniformity does not appear as a premise in

that reasoning. Further, the Nyāya has argued at length for the law of causality and not merely taken it for granted as we have seen. If these arguments make sense, the charge of circularity is not in order.

The charge of circularity, in the highly developed Nyāya view, is justified only when the conclusion is (or can by analysis be shown to be) identical with a premise (or a part of a premise) brought in support of the conclusion or the truth or reliability of the premise is indispensably dependent (*sāpekṣa*) on that of the conclusion. The Nyāya position is not circular in this sense. The crucial premises (the remainder being formal operations) in the counterfactual reasoning discussed earlier are (1) that if smoke were produced neither by an aggregate that includes fire nor by an aggregate that excludes fire, smoke would not be produced and (2) that smoke is produced. The conclusion is that smoke is produced by an aggregate that includes fire. Thus clearly the conclusion is never identical with the premises. So the only remaining question is whether the truth or reliability of the premises is materially dependent on that of the conclusion. We have here two premises. First, take the premise that smoke is produced. Is it indispensably dependent on the conclusion that smoke is produced by an aggregate that includes fire? No, for the evidence for that premise comes directly from observation. Smoke is observed to come into being where it was nonexistent before. This suffices to show that the premise is reliable. [Being produced is analyzed by the Nyāya to mean being the negatum of a prior absence (*prāgabhāvapratiyogitva*)—that is, coming into being after being nonexistent before.]

Now take the other premise that is a counterfactual proposition both the antecedent and the consequent of which are known to be false. Since this premise is the willful articulation of a known counterfactual situation, it is not true or reliable for the Nyāya.[11] Given the Nyāya theory of truth or reliability, the claim that truth or reliability of that premise is not indispensably dependent on that of the conclusion is vacuously true, for the premise is not true or reliable in the Nyāya view (though the premise is a part of an argument that contributes (*anugrāhaka*) to the truth or reliability of induction).

A theory of truth or reliability cannot be discussed in a short space and we cannot properly discuss the Nyāya theory of truth/reliability here. Still, it is clear that the epistemic structure of the premise is significantly different from that of the conclusion. The latter is an indicative proposition. The former is a conditional with a false antecedent and a false consequent. It will take an adequate theory of counterfactual conditional and a substantial argument to show that the truth or reliability of such a conditional depends on such an indicative proposition. Neither Carvaka nor Hume has provided that.

Further, many would agree that the acceptability of the counterfactual premise is not dependent on the conclusion that smoke is produced by an ag-

gregate that includes fire. This may be seen if we realize that the premise is not critically about smoke and fire. The main point of the premise is that if something were not produced by an aggregate that includes a particular kind of thing or by an aggregate that excludes that particular kind of thing, that something would not be produced. No reference to smoke being produced specifically by an aggregate that includes fire is materially relevant for this. The epistemic task of the premise is accomplished by relying on logical laws like the law of excluded middle and the obvious truth that if something is not produced by any aggregate, it is not produced. It thus appears that neither premise of the counterfactual reasoning is indispensably dependent on the conclusion and that the reasoning is not circular.

A skeptic may point out that the Nyāya case for induction involves at least the induction that the best available explanation is reliable. Accordingly, the Nyāya is guilty of what has been called rule-circularity.[12] When one relies on the same rule for which one is arguing, there is rule-circularity. The skeptic may add that whatever reasoning is offered in support of induction would inevitably involve some induction and be invariably circular.[13]

But the assumption behind this objection is that if the same rule is involved in the justification of a given rule, the reasoning is circular. This assumption is questionable. Suppose that one has to argue for the rationality of deduction. One has no choice but to rely in part on deduction to do so. Similarly, if a skeptic denies that there are any sources of knowing, there is no choice but to rely on some sources of knowing to refute the skeptic. So the above kind of circularity, if recognized as a defect, would threaten the status of not only induction but that of all knowing. If accordingly the assumption is rejected to allow for the possibility of knowledge, the objection would fail.

Sometimes the point of the distinction between rule-circularity and premise-circularity is misunderstood. The point is that just as one has no choice but to use memory to check trustworthiness of memory in general or just as one has no choice but to use deduction to check trustworthiness of deduction in general, so also one has no choice but to use induction to check trustworthiness of induction in general. Howson has argued in rejecting that rule-circularity is not a flaw that there is nothing circular in testing another person's memory with my own or somebody else's memory or testing the soundness of a particular deductive rule like modus ponens that does not involve that particular rule itself (HP 25, 28). But this is based on confusion. Those who hold that rule-circularity is not a flaw are not arguing from testing one particular memory with another particular memory or testing one particular deductive rule with another deductive rule. Rather, they are arguing from the general faculty of memory being tested or the general method of deduction being tested. And then rule-circularity is unavoidable. (For more discussion of

epistemic circularity and rule-circularity, one may see B. Reed, "Epistemic Circularity Squared? Skepticism about Common Sense," *Philosophy and Phenomenological Research*, 2007, 186–97; M. Bergman, "Epistemic Circularity and Common Sense: A Reply to Reed," *Philosophy and Phenomenological Research*, 2007; and N. Tennant, "Rule-Circularity and the Justification of Deduction," *The Philosophical Quarterly*, 55/221, 2005.) Further, the skeptical claim that no argument can show the reliability of induction without presupposing that reliability itself involves induction and cannot be sustained without presupposing its reliability. Thus if rule-circularity is a flaw, the skeptical objection is flawed too. In other words, if the reliability of induction cannot be challenged without presupposing that reliability, the challenge is futile. In particular, a skeptic can ill afford to disown inference to the best explanation. The skeptical position should be argued for and the explanation offered by the skeptic should be better than that of the opponent and, therefore, qualify as the best explanation.

The skeptic, again, may revive the complaint that the Nyāya arguments brought in defense of causality and induction are not deductively valid. But so what? The community of scholars does not grant the skeptic the exclusive right to decide what counts as a reason (*hetu*, *gamaka*, *apadeśa*, *liñga*, *sādhaka*, *upapatti*, etc.) and does not endorse that all rational performances are deductively valid. This applies to the world of Sanskrit scholarship as well as the world of contemporary scholarship. In the Nyāya view, it is the community of scholars that is the custodian of the world of learning (*vidyā*, *śāstra*) and it is that community that preserves and revises it. As long as the larger scholarly community does not enjoin the narrow-minded view that all reasons must be deductively valid, the Nyāya is under no obligation to produce only deductively valid arguments in defense of causality and induction. (This is not to suggest that Nyāya logicians have neglected deduction, for Nyāya logic includes an advanced formal logic.) The skeptic may retort: why then embark on the project of justifying induction in the first place? But self-examination, self-defense in the face of opponents' objections and refutation of opponents' views are all parts of the ongoing scholarly activities. This is precisely what the Nyāya is doing while trying to defend induction.

While on the charge of circularity, it is useful to add that Gadadhara has carefully distinguished between pervasion involved in causation and pervasion required for inference. The former is: not being the negatum of an absence belonging to the locus of the effect in the moment immediately preceding its origin. To explain: if something is the negatum of an absence in the locus of the effect immediately before its origin, it is absent where and when the effect is produced. Since the effect has come into being without it, it cannot be regarded as a cause that is a necessary condition. Hence a cause must

be different from that—that is, it must not be the negatum of such an absence. For example, fire is not the negatum of an absence belonging to the locus of smoke immediately before its origin. On the other hand, pervasion for inference is the following: not being the negatum of an absence that is co-located with the probans and that is not co-located with the negatum. Thus the two pervasions are different. [The differences are substantial, as a detailed study of inferential pervasion that will be lengthy, difficult and that cannot be undertaken here, will inevitably show. One obvious difference, of course, is that causal pervasion, unlike inferential pervasion, includes a reference to the time of origin.] Not that causal pervasion will be brought in as a premise while arguing deductively for inferential pervasion and vice versa. Nyāya logicians are not up to that. Still, it would be a serious mistake to confuse one for the other and Gadadhara is putting that on notice. In the words of Gadadhara:

> It cannot be said: since effect-hood involves pervasion, cognition of effect-hood is itself cognition of [inferential] pervasion. . . . For pervasion involved in effect-hood is different from pervasion leading to inference: while the former is: "not being the negatum of absence belonging to the locus of the effect in the moment immediately preceding the effect," the latter is: "not being the negatum of absence that is co-located with the probans and that is not co-located with the negatum." (GD 681)

The Nyāya response to the charge of circularity, it may be noted, is quite different from that of Braithwaite mentioned earlier. The former is not attempting to show that the inductive justification of induction meets the criteria of subjective validity or the criteria of subjective and objective validity—which was found to be unsatisfactory. The Nyāya response that may have more promise is fourfold: (1) It is questionable if rule-circularity is a flaw; at least rule-circularity cannot be construed to mean that the justification of induction must be on exclusively noninductive grounds. [This is not, as already said, any worse than having to fall back on methods of knowing in order to refute some skeptics who might claim that there are no methods of knowing or, for the matter of that, having to rely (partly) on deduction in order to justify deduction.] (2) The principle of uniformity or causality or any other such principle is not needed as a premise in arguing for induction, because the argument concerned is not required to be deductively valid. (3) Causal pervasion and inferential pervasion are substantially different. (4) The conclusion of the counterfactual reasoning brought in defense of induction is not identical with the premises or a part of them nor are the premises indispensably dependent on the conclusion.

We now move on to the argument from belief-behavior conflict. This may remind one of an argument of G. E. Moore to defend what he called "common

sense propositions." Moore argued that a philosopher who denies or doubts such common sense propositions as that material objects exist or that time is real inevitably engages in behavior that conflicts with such claims—which refutes the denial or the doubt. The interesting point in Gangesa's case is that a similar argument has been brought in support of causal propositions like fire is a causal condition of smoke and, thereby, in support of induction.

The Carvaka skeptic claimed that one engages in practical activities always on the assumption of probable causes. Hume also said that although the skeptical doubt is beyond resolution, this should not interfere with practical activities; all that one needs to do is to switch from the theoretical to the practical standpoint. Hume held further that although skeptical considerations lead to philosophical melancholy and delirium, it does not persist, for lively impressions or other thoughts or feelings divert us to other things. Additionally, although reason alone cannot overcome skepticism, reason supplemented by our natural desires, inclinations, instincts and habits allow us to recommit ourselves to rational activities including induction that follow our propensities. Thus Hume offers a psychological explanation of how inductive inferences are caused—an exercise in cognitive psychology—that is quite different from the justification of induction that is an epistemological exercise.[14]

Gangesa would agree with Hume in part on the psychological thesis. It is not the intention of Gangesa to deny that one is motivated to action by probable opinion. It is easy to think of situations (e.g., a scientist trying out a tentative hypothesis or a detective pursuing not so clear a clue) where this actually happens. Nyāya philosophers also acknowledge that skeptical doubt as a psychological state is routinely replaced by other states without needing any argument and also recognize the roles played by habits and inclinations. But what Gangesa definitely wishes to reject, if such is offered as a thesis in cognitive psychology, is that one is always motivated to action by probable opinion. Clearly, any Hume-like critic of induction who wishes to argue for such a thesis would have to rely on induction and thus forfeit his case. So a skeptic is not in a position to offer proper evidence for the claim. But further there is counterevidence (*bādhaka*) from uniform and unwavering action. That is, one does not remain doubtful about something being a cause of something else and still continue uniformly and unwaveringly (*niṣkampa-pravṛtti*) to procure the former in order to produce the latter. To doubt that something is a cause of something else amounts to endorsing the possibility or sometimes even the probability that the latter is produced without the former. If one were truly doubtful about something being a cause, one would try other alternatives, as the scientist or the detective in our examples would. Hence the very action of procuring something regularly and unwaveringly to produce something else reliably (though fallibly) shows the absence of any actual doubt. This then is a

thesis in cognitive psychology that Gangesa offers: uniform and unwavering voluntary action is prompted by doubt-free belief.

The issue cannot be avoided by advocating a cleavage between the theoretical and the practical points of view. The Nyāya does not dispute that it may be certain for all practical purposes that fire is a causal condition of smoke and still be theoretically possible that this is not so. This is implied in acknowledging the fallibility of induction. But such fallibility does not make induction doubtful. [We assume that particular observations like there is a cat on the mat are often reliable and doubt-free in spite of being fallible. Some skeptics do question this. But, as said, we are not here dealing with such a skeptic but only with someone who denies the justifiability of induction without denying the reliability of particular observations.]

But further, Gangesa is also building an epistemological argument from belief-behavior conflict for reliability of induction. That is, one's action provides the epistemic ground for rejecting the actual presence of doubt. [This does not imply that my believing *x* and acting on it makes *x* true; rather, the epistemic ground is provided, as explained below, by the success of the effort.] For example, the action of a honey gatherer to light fire to drive away bees from the honeycomb, say, is prompted by the cognition or belief that fire is a cause of smoke. Since smoke is the intended fruit (*phala*) of the action, when smoke is produced, the action becomes successful. The success of the effort (*pravṛtti-sāmarthya*) shows (i.e., gives the epistemic ground to the effect) that the said cognition or belief is reliable (*prāmāṇika*) and dislodges the claim that it is doubtful.[15] [Needless to say, the Nyāya does not hold that certainty or strong belief is knowledge. For example, one may be absolutely certain about seeing a snake in front while the thing in fact is a rope. Rather, the point is that success of the effort is a reliable (though fallible) sign for inferring the reliability of the (fallible) belief prompting the effort.] The issue here is not merely psychological, but epistemic. Gangesa is not claiming that it is psychologically impossible to harbor the doubt under the above circumstances, for it is not. Nobody can force the skeptic to free his mind of unfounded doubts. The Nyāya recognizes that desire (*icchā*) is a sufficient stimulant (*uttejaka*) to enable someone to hold on to even a glaring contradiction. Still, the point is that since there is epistemic ground from one's own action to show that induction is reliable, the skeptical doubt is out of place. In other words, uniform and unwavering action prompted by a belief is a reliable epistemic ground for reliability of that belief. This is why Gangesa says that such action is an obstruction to the doubt. It is an obstruction partly in the sense that it provides reliable evidence for absence of the doubt (that is quite different from the routine absence of the doubt when the doubt is replaced by some other psychological state). Unless the skeptic is able to refute this evidence the skeptical claim of

presence of the doubt is hollow (more on this below). When the doubt is eliminated (that does not involve that doubt is logically impossible) on reliable epistemic grounds, no additional reasoning is called for. Thus the skeptic's charge that there must be either an infinite regress or circularity in the justificatory process is untenable.

Gangesa took over this argument from Udayana. In a famous verse the latter said (NK, chapter 3, verse 7): if there is doubt, there is inference (for the fear of deviation with reference to a future time or place has to make use of inference); if there is no doubt, there is inference; doubt is removed by subjunctive reasoning; conflict is the limit of doubt. Udayana was replying to the charge of infinite regress. Could the doubt be revived after it is removed by subjunctive reasoning? No, said Udayana, as long as one acts unwaveringly. Unwavering action is in conflict with doubt and sets the limit to doubt—that is, does not allow one to have the right to doubt.

Sriharsa (twelfth century), an Advaitin skeptic, made some marginal changes in the wording of the verse and came up with a crushing rejoinder: if there is conflict, there is doubt; if there is no conflict, there is doubt all the more; how can then conflict set the limit to doubt and how can subjunctive argument set the limit of doubt (KKK 364)? His point is that the claim that conflict is the limit of doubt itself incorporates a generalization, viz., whenever there is conflict there is no doubt. Now he is not pressing for the irrationality of this or that induction, but of any and every induction. Since the argument from conflict is itself relying on an induction, albeit a different one, the skeptical doubt will inevitably haunt it and keep the regress alive, for where is the (noninductive) reason to show that this induction will hold in a new case?

Gangesa is replying directly to this rejoinder. He thinks that Sriharsa has misunderstood Udayana's argument. The latter is not first generalizing empirically that whenever there is conflict, there is absence of doubt and then arguing deductively after adding that as a premise that since there is conflict, doubt is gone. Rather, the point is that the unwavering action obstructs doubt.

Several things should be considered while interpreting this argument. First, in Gangesa's view, introspections (alone) in a limited sense are self-certifying. It never happens, he says, that I am not aware of anything and still believe that I am aware of something, nor that while I am aware of a pot, say, I introspect that I am aware of a piece of cloth. Even when I misperceive a shell as silver, I introspect unfailingly that I am aware of silver (TC 284–85).

A proper discussion of this view that introspection is in some sense incorrigible will take a lot of space and must be left out. Still, we note that Gangesa's view is similar to the view of Descartes that although we can call into question what we perceive by means of our senses, we cannot call into question that the ideas or thoughts of whatever is perceived hover before our minds.[16] For ex-

ample, I may be entirely wrong in claiming that what I see is a horse, but I cannot be wrong about claiming that I have the idea of a horse in my mind. So Gangesa rules out that when we act unwaveringly, we still have a lingering doubt in our minds. Of course we may be doubtful about fire being a cause of smoke and may be hesitant while acting upon it. But if we are certain about it, introspect it so and act upon it unwaveringly, we are not doubtful about it any longer, for the introspection that we are certain about it is reliable. In other words, if I am certain about something and my introspection says so, it is reasonable to accept that. This is an item of personal experience (*anubhava*) that (though fallible) is on its own ground reliable. If this is rejected, the price to pay will be much higher than merely rejecting induction.

Second, apart from the evidence from introspection, unwavering action by itself reliably proves absence of doubt. Udayana has distinguished between contradiction in language (*svavacanavyāghāta*) and contradiction in action (*svakriyāvyāghāta*).[17] The former is illustrated by "son of a barren woman" (*bandhyā-suta*) [similar to "married bachelor," familiar in the West]. Since barrenness stands for childlessness, this expression is a patent contradiction in terms. The latter is illustrated by someone actually saying "I am dumb." This sentence is not self-contradictory and there will be no conflict if the person merely writes it down. But the very act of articulating it aloud brings out the contradiction and falsifies it. [A solution to the age-old liar paradox may be worked out along these lines.] Just as the very fact of someone speaking out falsifies the claim of his being dumb that involves the lack of the ability to speak, so also the very fact of someone acting unwaveringly falsifies the claim of his being doubtful that involves indecision and inability to act unwaveringly. Needless to say, one may pretend to act unwaveringly and may not get caught and, whether someone is pretending or not, we may be wrong in judging that someone is acting unwaveringly. Still, it remains true that unwavering action is a reliable ground for lack of doubt.

In other words, Gangesa makes the general claims that whenever there is unwavering action, there is lack of doubt and that success of effort is a reliable sign for inferring reliability of cognition or belief that prompts effort. With regard to inference of reliability of prompting cognition from success of effort, Vacaspati Misra (ninth century CE, a great philosopher and author of masterpieces on the Nyāya, Advaita and Sāmkhya-Yoga) held that while an average cognition is not self-certifying (*svatahpramāṇa*), such an inference is.[18] While other Nyāya philosophers do not go as far as that, they recognize, as we have seen, a class of cognitions that are discernible as true or reliable by mental reflection. This is due to the special logical, semantic and epistemic relations holding within the contentness (*viṣayatā*)—that is, among the different contents (*viṣaya*) of the cognition. For example, that no barren women have sons

is discernible as true by mental reflection although that no rabbits have horns is not. Both are true general propositions; but an important difference between the two is that while the denial of the former involves a contradiction in language (*svavacanavirodha*), the denial of the latter does not.

Now, a part of what Gangesa is implying in rejecting the charge of infinite regress and circularity is that the skeptic is overlooking the difference in the epistemic status of the pervasions involved. When we deal with pervasions like "whenever the effort is successful, the cognition prompting it is true or reliable," mental reflection suffices for the purpose.[19] [This in no way denies that our expectations can seem to be satisfied even if our perceptions are false. For example, someone mistaking a rope for a snake could succeed (in his mistake) in avoiding the snake by running away from it. But even in such a case there is a factual core (albeit mistakenly interpreted). For the said person does as a matter of fact succeed through his effort in establishing some distance between himself and the thing in front. The crucial question, for the Nyāya, is whether an external sense organ plays a causal role for the false perception. If so, there will have to be a factual base even in our worst hallucinations. However, if no external sense organ plays a causal role, as it happens in a delusion, the experience cannot be regarded as perceptual (*pratyakṣa*). The underlying issues are once again deep and difficult and a proper discussion is beyond the scope of this work. But it may be noted that the Nyāya has worked out a highly developed and complex epistemology to back up its viewpoint. Some skeptics will no doubt insist that we can never get beyond appearances. But how does the skeptic know that? Doesn't he have to use induction and thus forfeit his case?] Since we are here no longer dependent on external sense organs, as we are in the smoke-fire case, the skeptical doubt arising from unobserved cases is not relevant. Once again, if the skeptic denies this and disowns the role played by mental reflection, the price to pay will be much higher than merely degrading induction. Consider, for example, that nothing is both blue and not-blue. Are not we sure through mental reflection that this is true? And, if we cannot be sure about this, how can we be sure about anything? So, unless a more sweeping skepticism is adopted, the role played by mental reflection should be admitted. Then it can be seen, through mental reflection, that the skeptical doubt (though logically possible) is not appropriate for pervasions like "whenever the effort is successful, the cognition prompting it is true or reliable."

It may be noted that the Nyāya does not subscribe to the dichotomy between analytic truths and synthetic truths (if the issue is framed in modern terms) that has been popular in modern philosophy since the time of Kant. From the Nyāya viewpoint there is continuity between what in modern philosophy are called analytic truths and synthetic truths and even logical truths

have a minimal factual content, for they too are true of the world. However, the Nyāya recognizes the distinction between beliefs the reliability of which can be discerned by mental reflection alone and beliefs that are not so. What are called analytic truths in modern philosophy would come under beliefs the reliability of which can be discerned by mental reflection alone in the Nyāya scheme. Once some data have been received from the external senses the inner sense can analyze and discern the connections at the level of contentness. In this way the Nyāya recognizes that given some premises a conclusion may follow logically or analytically from them and thus acknowledges the role of deduction. Similarly, once we have concepts like that of a bachelor, we can also have sentences like "a bachelor is married," the falsity of which can be discerned by mental reflection alone as a case of contradiction in language (*sva-vacana-virodha*). It is in this sense that the Nyāya speaks of beliefs that are reliable (or unreliable) by mental reflection alone.

This role for mental reflection, it should be noted, is directed primarily toward concepts that are complex (*sakhanda*) where it can be shown by analysis what is included in or excluded from the contentness. [The mind (or more accurately, the inner sense: *manas*) also has the function of making possible direct awareness of our internal states like pleasure and pain.] Thus it does not amount to endorsing an intuitive reason in the rationalist sense and does not compromise the traditional Nyāya perspective that perception is the leader among the sources of knowledge. [Gotama put perception first in his list of sources of knowledge and added that inference is preceded by perception (NS 1.1.4, 1.1.5). Nyāya philosophers have interpreted this to imply that while reasoning can expose errors in sensing and also allow us to extend our knowledge to imperceptibles, reasoning alone cannot override the testimony of the senses. For example, a reasoning to prove that fire is cold will be set aside because it is contrary to the perception that fire is hot, if for no other reason.]

While there is general (but not universal) support among Nyāya philosophers in advocating the counterfactual argument and the argument from belief-behavior conflict, some (including Gangesa) additionally hold a view (opposed by Raghunatha and others) involving what may be seen as an enhanced role for the external senses. This consists in admitting an extraordinary kind of external perception called *sāmānyalakṣaṇa*, with common characters (*sāmānya*) providing the sensory connection (*pratyāsatti*), as a source of the awareness of pervasion. Perception, in the Nyāya view, cannot take place without sensory connection. That sensory connection is a necessary condition for perception follows from considering such as the following: while we can see things in front of a wall, we cannot see things behind that wall. But if sensory connection is needed for perception, how can there be sensory connection with all the particulars of a kind—past, present and future—that are covered in the awareness of perva-

sion? Under the circumstances as an answer to this question, it is proposed that common characters, among which some are admitted to be eternal on independent grounds and to be perceptible (if belonging to perceptible particulars), provide the sensory connection.

To explain: When an ordinary (*laukika*) perception of a particular takes place, the common character inherent in that particular may also be perceived. After that there may take place the extraordinary (*alaukika*) perception of all the particulars sharing that character, it being the qualifier (*viśeṣaṇa*) of the particular with which there is ordinary sensory connection. The individual features of the particulars do not become the contents of such extraordinary perception. Further, such awareness can take place only when there is an ordinary sensory connection with a particular having that character.[20]

Thus the induction that all smokes are caused by fire is, in this view, a case of external perception and not inferential at all. The import of the induction is that smoke as qualified by the common character smokeness is caused (in part) by fire as qualified by the common character fireness. Smokeness and fireness are, in this case, the limitors (*avacchedaka*) or specifiers of respectively the characteristic of being an effect and the characteristic of being a causal condition. The so-called inductive leap may take place through an extraordinary perception when there is an ordinary sensory connection with a particular smoke and a particular fire. Thus:

> Awareness of pervasion that comprises all smokes, etc., takes place through the sensory connection called *sāmānyalakṣaṇa*. Since otherwise the smoke in the hill is not known to be pervaded [by fire], how is there inference [of fire] from that serving as the ground? (TC 230)

In a second version, not the common character itself, but its cognition, is said to be the sensory connection. This is because both eternal and non-eternal entities serve as common characters and may pave the way for this kind of extraordinary perception of all their substrates. But a non-eternal character may cease to exist. If the common character itself is held to be the sensory connection, no such extraordinary perception can take place when that character is nonexistent. This contingency is avoided by holding that not the character but its cognition supplies the sensory connection. Obviously, cognition of the character, say in the form of a remembrance, may be there when the character is nonexistent. Thus:

> If by *sāmānyalakṣaṇa* is meant what is of the nature of a common character, the character itself is the sensory connection; but if what is meant is that of which the common character is the specifier, cognition of that [is the sensory connection]. (GD 773)

It may be noted that in the first version, too, the cognition of the common character is required, for the character must be featured as the qualifier of that with which there is an ordinary sensory connection. It should also be noted that a character may be simple or complex. If the character happens to be complex, the simple character at the bottom should be held to provide the sensory connection through an appropriate indirect relationship. Thus: "Common characters are of two kinds, simple or complex. If the character is complex, it is still a simple character that functions as the sensory connection through an indirect relation" (GD 779).

It is also held that the skeptical doubt that smoke, etc., may deviate from fire, etc., too is a judgment of external perception. This kind of extraordinary perception should be admitted, it is argued, as the source of the skeptical doubt as well. For the doubt is not about cases observed in the ordinary way, but about cases unobserved in the ordinary way. The only way in which these could be (perceptually) presented before the mind is through such extraordinary sensory connection provided by the common characters (TC 235–36).

Many Nyāya philosophers do not regard the skeptical doubt or the inductive generalization as cases of external perception and are not persuaded that this kind of extraordinary perception should be admitted. However, there may be no overriding difficulties in admitting this kind of extraordinary perception. Since the internal criteria for settling what should count as external perception [apart from the innocuous truism that an external sense organ should function as an instrument (*karaṇa*) for such perception] are far from noncontroversial, this view remains an interesting option in epistemology. Needless to say, the view is not an invitation to any kind of mysticism or esotericism, but is promoted to address specific epistemic concerns. In fact, one motivation for it is not to allow any enhanced role for mental reflection, to promote instead a dominant role for the external senses and to avoid questions that could in the long run spell trouble for an empiricist and common sense realistic point of view. [This is not going to impress the skeptic, but may impress those leaning toward empiricism and common sense realism.]

To sum up, the skeptical doubt about induction involves doubting such beliefs as that fire burns, food nourishes or language is a tool of communication with others. The said doubt is untenable because it inevitably leads to belief-behavior contradiction that is an instance of contradiction in action as distinguished from contradiction in language. Thus if one doubts that food nourishes and thinks that food may not be indispensable for survival, one would not continue to eat uniformly, day after day and without any hesitation in order to be able to survive. Similarly, if one is doubtful about language being a means of communication with others, one would not continue uniformly to use language for that purpose. For, if one were doubtful about the

outcome of an action, one would explore other alternatives and would not pursue that course of action uniformly and unwaveringly. Thus, an important thesis in cognitive psychology that emerges is that uniform and unwavering action is caused by doubt-free belief. Such action is also an obstruction to doubt in an epistemic sense. The fact that one acts uniformly and unwaveringly to get certain results proves in a reliable (though fallible) way absence of any actual doubt about the success of the action. Since the skeptical claim about doubt is obstructed by a reliable argument, that claim is not tenable until the given argument is refuted. Thus belief-behavior conflict yields both an important thesis in cognitive psychology stated above and a powerful objection to the skeptical claim about doubt. We also learn from introspection that when we act unwaveringly, we are not subject to doubt. Such an introspection testifying to absence of doubt is reliable. Further, whenever an action prompted by an anticipation of what is to be achieved is successful, cognition prompting the action is reliable. No skeptical doubt arising from the possibility of (externally) unobserved cases is relevant here for reliability of this general claim is discernible by mental reflection alone. Since in this way absence of doubt may reliably (though fallibly) be asserted in cases of belief-behavior conflict, the skeptical charge of infinite regress or circularity in justificatory arguments is unfounded.

Moreover, factual generalizations are vindicated by the counterfactual argument exploring the implications that show the affinity and continuity between deduction and induction. For example, "fire burns" implies that if I were to put something I treasure into fire, it would be burned. Since I am certain about this, I ensure that this does not happen. Past observations do not directly provide the rational ground for making general claims about the future, but they do so indirectly by way of the counterfactual argument. The mind is dependent on the eyes, the ears and so on, for information about the external world concerning what was, what is or what will be. But what would have been is different from these and can be legitimately explored by the mind itself on the basis of what has been learnt from experience. A celebrated counterfactual in defense of the stock induction that all smoky things are fiery is that if smoke were produced neither by an aggregate that includes fire nor by an aggregate that excludes fire, smoke would not have been produced. We observe that smoke is produced. So the consequent is false. This logically implies falsity of the antecedent and given OC we should hold that smoke is produced by an aggregate that includes fire. This favors the induction that all smoky things are fiery.

Finally, neither the doctrine of causal power nor the doctrine that the cause potentially contains the effect is acceptable. But the observed fact that some kinds of things come into being only on the occasion when some other kinds of things are present is best explained by supposing that the former is depen-

dent on the latter for its origin—which justifies the law of causation (in the sense of a cause being a constant and indispensable antecedent) and thereby induction. It is this powerful defense of causation that may turn the tables against the skeptic and in favor of rationality of induction. Regarding inference to the best explanation, it should be noted that a hypothesis that is validly derivable by adding an accepted general law as a premise or fulfills one or more of the criteria of economy is superior to another that is not so. Further, it should be noted that the evidence for plurality of causes is unsatisfactory as also that the notion of being of the same kind may not be explicable without admitting universals that, in their turn, may help to justify induction. Both Carvaka and Hume have questioned the causal law. Quite appropriately the Nyāya has offered substantial arguments outlined earlier for the causal law, arguments to which followers of Carvaka or Hume have given no adequate response. The principal rational grounds for induction, then, come from the counterfactual argument, the argument from belief-behavior conflict, the principle of observational credibility (OC), the principle of inference to the best explanation, refutation of the charge of circularity, the doctrine of universals and the defense of the law of causality.

Such in outline is the later Nyāya justification of induction as we have understood it. Many compromises and simplifications had to be made while borrowing modern terminology for the ease of communication and much of the rigor of the extremely precise Nyāya technical language had to be sacrificed. Still our effort may be a small step toward serious comparative and systematic study. It should, however, be clear, given the serious difficulties facing various contemporary views already discussed, that the Nyāya view is undoubtedly of current philosophical interest. While the Nyāya theories of universals and causality have their perennial place among great philosophical theories, what we find specifically attractive in the later Nyāya justification of induction is the exploitation of the counterfactual conditionals, the notion of contradiction in action, inference to the best explanation, a sophisticated view of circularity and recognition of the value of hypotheses. It is this thorough and comprehensive approach to the problem with a series of modal, epistemological and ontological moves that gives the later Nyāya theory its distinctive appeal.

While Aristotle, the Stoics and the Epicureans made great contributions to the study of induction, there is no firm evidence to show that in the Western tradition the problem of induction was explicitly recognized and elaborately discussed as a serious problem before Hume. But clearly the Indian logicians have done that long before that time. Again, in the Western tradition (notwithstanding the good work done by Whewell, Herschel and Mill earlier in the nineteenth century) it was left to Pierce in the late nineteenth century to bring out the value of the method of hypothesis (calling it abduction and distinguish-

ing it from deduction and induction). Even after that philosophers in this century took time to warm up to the idea as can be gathered from the relative lack of any substantial discussion of this method in the first decades of the twentieth century. The same is true of the link between causation and the counterfactual conditionals. Although some traces are found in Hume, no detailed and systematic study of them is found in any Western writing before the twentieth century. The same, further, applies to the principle of economy. While the principle is very old and sometimes called the Occam's razor, no Western philosopher has systematically and explicitly studied different kinds of economy before the twentieth century. Similarly, a systematic study of inference to the best explanation is emerging only in some recent publications. As an epistemological theory Nyāya empiricism, though older, appears to be more developed than the modern European empiricism of Locke, Berkeley and Hume. The powerful defense of causality, the careful analysis of circularity, the sophisticated arguments from counterfactual conditionals and belief-behavior conflict appear to give to Nyāya empiricism the decisive edge. No doubt, for some philosophers, skepticism will remain a more attractive position. But for those with a different inclination, the Nyāya position offers a viable option.

The main advantage of the Nyāya view is its well-balanced and multipronged approach to the problem. So far as the analytical justification of induction (seeking virtually to show that the problem of induction is a pseudo-problem) is concerned, it is unlikely that the skeptic will ever be persuaded that the criteria of inductive acceptance are rational in their own right. The Nyāya avoids this kind of head-on collision with the skeptic and quick shortcut to the solution. Instead, the Nyāya has recognized the genuineness and seriousness of the problem and, with great patience and understanding, has sought to expose the various questionable strands around which the skeptical case is built (such as that the skeptical doubt arising from the logical possibility of deviation amounts to making dogmatic claims about empirical possibilities without any shred of empirical evidence, so that the skeptic does not qualify as either a commoner or an expert). Again, an exclusively or predominantly inductive justification of induction will inevitably invite the crushing charge of circularity. No doubt the Nyāya does not concede, even if the skeptic so demands, that induction must be justified on purely noninductive grounds. This is an impossible task. If this is what the skeptic dogmatically insists on (while the larger community of scholars does not endorse this), there can be no worthwhile philosophical debate. Just as it is proper to (partially) rely on a shining lamp to reveal it, so also it is proper to partially rely on induction to reveal its legitimacy. But the Nyāya acknowledges that a justification of induction on mainly inductive grounds is ineffective and also unnecessary. That is why it brings in additional arguments from counterfactual conditionals, etc., and recognizes

the role of mental reflection (that serves [among other things] the purpose of what *a priori* reasoning in modern terminology would sometimes seek to achieve). The pragmatic justification utilizing the straight rule and counterfactual analysis is the closest, among the modern views, to the Nyāya view. But as it stands, the pragmatist position is open to defeating objections such as that the argument for the straight rule applies equally to an infinite number of inductive rules, so that there will be no objective basis for our choice among competing predictions and that the straight rule cannot justify the accuracy of predictions in the short run. However, such objections would have no force against the Nyāya position, for considerations from belief-behavior conflict and inference to the best explanation would ensure that such predicaments do not arise. Surely the principles of inference to the best explanation, such as considerations of economy, can justify the accuracy of predictions in the short run. (If considerations of economy are thrown out as irrelevant or inadequate, the price to pay will be much higher than losing induction.) Similarly, conflicting predictions cannot all and always equally satisfy considerations of economy and cannot all and always have the same implications for our behavior. (This is not to deny that more than one divergent predictions may satisfy [at least some and maybe all] considerations of economy at the same time. There are certainly no *a priori* arguments to show that this could not happen. But if this does happen, there is no choice but to pile up more inductive evidence to see if the field could be narrowed down further.)

In the same way, although great strides have been made in the investigation of probability in recent times, we are not convinced that this by itself would produce a satisfactory solution to the problem of induction. The natural setting of the calculation of probability is for situations where the terms for predictions can be drawn up in such a way as to allow a conceivable chance of settling their accuracy on the basis of specific observations. This may happen with particular hypotheses, such as that it will rain tomorrow. (A favorite area for the study of probability, quite naturally, is that of betting where it can be determined who wins the bet.) But if the hypothesis is a factual generalization over an unlimited domain, no one can (assuming that only confirming instances are available) decisively settle the accuracy of the prediction and the measure of probability, for no one can know about the truth of each singular conditional deducible from the hypothesis. Hence we are not hopeful particularly in the light of the many difficulties in the major theories of probability discussed earlier that an adequate theory of probability will solve the problem of justifying factual generalizations over indefinitely large domains. We are probably better off in trying to build the bridge between inductive evidence and reliability by exploring counterfactual conditionals and so on, as the Nyāya does.[21]

Before concluding we look briefly at the so-called new riddle of induction introduced by Goodman.[22] Carvaka and Hume tried to show that past and present observed confirmation of a hypothesis does not provide any rational ground for upholding the hypothesis in the future. Goodman's new riddle highlights the problematic nature of the relation between observed evidence and future prediction in a different way.[23] Suppose that all emeralds observed so far are green. This seems to confirm that all emeralds are green and permit the prediction that the next emerald to be seen will be green. But now consider the concocted predicate "grue." Something is grue if it has been found to be green whenever it has been observed so far or it is not yet observed and will be observed to be blue. Clearly, the observed evidence that seems to confirm that all emeralds are green also seems to confirm that all emeralds are grue. But then we seem to have two conflicting predictions equally confirmed by the same inductive evidence. If all emeralds are green, the next one should be green, but if all emeralds are grue, the next one should be blue. It can be easily seen that we can concoct an indefinite number of grue-like predicates and the same difficulty will arise in each case. That is, if we want to, we can always come up with new, fabricated predicates incorporated into empirical hypotheses that will lead to predictions conflicting with those based on commonly accepted empirical hypotheses while both sets of hypotheses seem to be equally consistent with the observed data. Can induction be rational when it seems to produce such contradictory results?

Goodman's own solution is that the riddle does not invalidate induction or the generalization formula as such but presses home the need for criteria to separate projectible predicates like green from cooked-up, nonprojectible predicates like grue. The projectible predicates are essentially the well-entrenched ones. What makes a predicate better-entrenched? Essentially that it has a longer history. In Goodman's own words:

> we must consult the record of past projections. . . . Plainly, "green," as a veteran of earlier and many more projections than "grue," has the more impressive biography. The predicate "green," we may say, is much better entrenched than the predicate "grue."[24]

Some critics have complained that such an account of entrenchment leaves the progress of science to luck. Is it merely a stroke of luck that "green" has a longer and more impressive history and biography than "grue"? If so, there is the danger that growth of science may be stultified for excluding hypotheses with unfamiliar or new predicates. Goodman has responded to the criticism by arguing that entrenchment and familiarity are different concepts.[25] An unfamiliar predicate may turn out to be well entrenched if the coextensive or parent or comparable predicates are already in frequent and wide circulation.

Although Goodman's theory is more elaborate than our sketch suggests, the criticism, however, has a point. First, Goodman does not show how the danger of excluding new predicates that are not coextensive with or derived from or comparable to other predicates that are already in circulation can be avoided. Second, projectibility and entrenchment are, because of the emphasis on the history, overly dependent on past projection. But for Carvaka or Hume past regularity alone fails to provide rational ground for future regularity and Gangesa, as we have seen, concurs with that.

Quine has offered to explain the distinction between projectible and nonprojectible predicates by saying that while the former are true of things of a kind the latter are not.[26] Being of a kind depends on similarity. The more similar things are the more reason that they are of the same kind. Accordingly, a kind is a set of objects that are more similar to a paradigmatic member of the set than they are to something else (called a foil) that is not a member of the set and is too dissimilar to the paradigm. But the difficulty in this view centers round the basis of choosing the paradigm. Is the paradigm chosen because it has certain features or not? If the first, objects should become members of a set by virtue of having most or all of the paradigmatic features which, then, are the family of common features that account for membership of the set. Projectibility then depends on sharing some common features. But objects in a nonprojectible set too may be said to share some common features, such as (at least trivially) that they are grue. So unless we have some reasonable criteria to separate the "right" kind of common features from the "wrong" ones (and none are provided by Quine), the division between projectible and nonprojectible predicates would collapse. If the second, someone may have chosen the paradigm for no reason and others may have followed suit merely for personal reasons. Projectibility then may not have any rational foundation and even inductions with projectible predicates may be irrational. So once again it needs to be shown that although the paradigm is chosen not because it has certain features the set still has a rational foundation but Quine has not done that and it is unclear that a rational basis can be provided. Undoubtedly, a skeptic would like to utilize the situation to press home the irrationality of induction.

The new riddle of induction has generated considerable debate in recent decades and many other solutions and their criticisms have been offered. It would take a whole book to discuss the merits of these solutions and we must skip that. We, however, look briefly at a similar development in Sanskrit logic in the hope of throwing some light on this recent controversy.

Take the stock inference of fire in a hill from smoke. As pointed out earlier, the hill is the inferential subject (*paksa*) wherein a typical case smoke is observed and fire is not. That there is fire in the hill is open to doubt; the doubt

is removed by the inference of fire in the hill. The inference is based in part on the general premise or pervasion (*vyāpti*) that all smoky things are fiery. The general premise is supported by observation of instances where smoke is found with fire and/or observation of instances where absence of fire is found with absence of smoke. Here smoke is the pervaded (*vyāpya*: something the extension of which is not wider than that of the pervader, *anatirikta-deśavṛtti*) and fire is the pervader (*vyāpaka:* something the extension of which is not smaller than that of the pervaded, *anyūna-deśavṛtti*). The pervasion is supported by observation of instances where smoke is found with fire and/or observation of instances where absence of fire is found with absence of smoke. The former are positive instances (*sapakṣa*) and the latter are negative instances (*vipakṣa*). The inferential subject is neither a positive instance nor a negative instance, for presence of the probandum is reliably known in a positive instance before the inference and absence of the probandum is reliably known in a negative instance before the inference and neither the presence nor absence of the probandum is in a typical case reliably known in the inferential subject before the inference. [However, in atypical cases presence or absence of the probandum may be known in the inferential subject.]

Now take the cooked-up property of "not being either the inferential subject or a negative instance" (disni: *pakṣa-vipakṣa-anyatara-anyah*) cited by Gangesa.[27] This property in a typical case is true of any positive instance: a positive instance (being where presence of the probandum is reliably known) is not either the inferential subject (where neither presence nor absence of the probandum is reliably known) or a negative instance (where absence of the probandum is reliably known). In the above stock example a case of disni is not being either the hill or a lake: the latter is true of a fiery kitchen hearth that is neither the hill nor a lake. It should be clear that by definition in typical cases disni is present wherever the probandum is reliably known to be present before the inference. [Disni is also not true of any negative instance: it is not true of any negative instance that it is neither the inferential subject nor a negative instance, for it is a negative instance and if something is a negative instance, it is also either the inferential subject or a negative instance (i.e., an inclusive disjunction is true if either disjunct is true). Thus, by definition, in typical cases wherever there is absence of disni there is absence of the probandum.] It seems to follow that there is warrant for the generalization that wherever there is the probandum there is disni or that disni pervades the probandum. In the above stock example, then, there seems to be warrant for the generalization that no fiery things are either the inferential subject or a negative instance.

At the same time disni cannot be true of the inferential subject. If disni pervades the probandum, absence of the probandum in the inferential subject

then follows from absence of disni. But we also reliably know that the probans belongs to the inferential subject (in the stock example: the hill is smoky) and that wherever there is the probans there is the probandum (in the same example: all smoky things are fiery). Thus the above set of facts seems to warrant both inference of the probandum and its absence in the same thing at the same time—a contradiction. We symbolize this by replacing the inferential subject with "this," the probans with "M," the probandum with "P" and being either the inferential subject or a negative instance with "Q" as follows.

All M is P.
This is M.
Therefore, this is P.

But also

No P is Q.
This is Q.
Therefore, this is not P.

The problem is mainly due to that the same generalization formula that permits the induction that wherever there is the probans there is the probandum also permits the induction that wherever there is the probandum there is disni. It is in this respect that this problem is similar to the new riddle of induction. In Goodman's example the observed facts seem to support both that all emeralds are green and that all emeralds are grue. If all emeralds are green, the next emerald should be green. But if all emeralds are grue, the next emerald should be blue. This is a contradiction pointing to some possible gap in the generalization formula. In Gangesa's example the observed facts seem to support in a typical case both that all smoky things are fiery and that no fiery things are either the inferential subject or a negative instance. If all smoky things are fiery, then (since the hill is observed to be smoky) the hill is fiery. But if no fiery things are either the inferential subject or a negative instance, then (since it is true of the hill that it is either the inferential subject or a negative instance), the hill is not fiery. Here too is a contradiction pointing to some possible gap in the generalization formula.

As another example (freely coined by utilizing Nyāya views) take the inference that this mango is colored because of being a fruit. Here an instance of disni is "not being either the mango or an air molecule." [In the Nyāya view air is colorless.] "Not being either the mango or an air molecule" is true of any reliably known colored thing, such as a banana or a pebble. [As already said, the inferential subject is not included in the class of positive instances in a typical case.] So it seems to be permissible to generalize that nothing colored

is either a mango or an air molecule. If this is accepted, it follows that this mango is not colored. But at the same time it is reliably known that this mango is a fruit and that all fruits are colored. Given these premises it follows that this mango is colored. Once again we have a contradiction pointing to some possible gap in the generalization formula. [Needless to say, in this example as well as in the previous example of inference of fire from smoke in a hill, the singular conclusion could be replaced by a universal or a particular statement requiring appropriate changes in the rest of the argument as well.]

The following is a solution (among others) mentioned in Gangesa's TC.[28] Induction does need the support of observation of positive instances or negative instances. Further, there should be nonobservation of any counterexample. Thus the generalization formula so far comprises observation of positive instances or observation of negative instances and nonobservation of any counterexample. The assumption that this is the whole story, however, leads to the problem. To solve the problem it needs to be added that a reliable induction must also have the support of additional reasoning to counter the doubt that the induction may be false. The doubt that an induction may be false is reasonable; an induction includes a claim about future countless cases based on favorable observation of a limited number of past or present cases. But sometimes an induction confirmed in a large number of cases is found later to have a counterexample. So it is reasonable to suppose that a counterexample may be found in other cases where none has been found so far. Such doubt should be countered by additional reasoning that explores the consequences of supposing that an induction is false and shows that an undesirable consequence results from that. Such additional reasoning is called *tarka* that we translated as counterfactual reasoning: CR. It includes a counterfactual conditional the antecedent and the consequent of which are false. The following reasoning as noted earlier has been offered in support of that all smoky things are fiery.

If smoke were produced neither by an aggregate that includes fire nor by an aggregate that excludes fire, smoke would not have been produced.[29]

We develop following the earlier discussion the argument as follows. Gangesa has offered a counterfactual conditional to back up the induction that all smoky things are fiery. The conditional is: if smoke were produced neither by an aggregate that includes fire nor by an aggregate that excludes fire, smoke would not have been produced. But we observe, it is implied, that smoke is produced. So the consequent is false. It follows (by applying the implied law of *modus tollendo tollens*) that the antecedent is false. So we derive (by applying the implied De Morgan law) that smoke is produced either by an aggregate that includes fire or by an aggregate that excludes fire. Now we have two opposed factual claims, viz., (1) that smoke is produced by an aggregate that

excludes fire and (2) that smoke is produced by an aggregate that includes fire. It is again implied in Nyāya empiricism (and empiricism in general) that of two factual claims the one that has observational support is preferable to the one that does not. This may be called as noted the principle of observational credibility (OC). Given OC, it is then accepted that smoke is produced by an aggregate that includes fire. But to say that smoke is produced by an aggregate that includes fire is to say that fire is a constant antecedent of smoke, for a causal condition (*kāraṇa*) is defined in part as a constant (*niyata*) condition. ["Constancy" is added to separate a causal condition from an accidental factor such as a donkey that happens to be present where smoke is produced and is not a causal condition of smoke.] The argument thus bestows favor (*anugraha*) to the induction that wherever there is smoke there is fire by showing that its denial leads to the undesirable consequence (*aniṣṭaprasañga*) of conflict with reliably accepted views.

The above argument implicitly utilizes logical laws like *modus tollendo tollens* as well as OC. While even logical laws are not above challenge, they are as safe as it gets; proponents of inductive skepticism like Carvaka or Hume accept them as well. Accordingly, it is not absolutely necessary to argue for them here. So far as OC is concerned, critics of induction like Carvaka or Hume should not reject it. Although Carvaka rejects an inductive leap into the future as unreasonable, he holds that particular observations may be reliable (*pramanika*) and are the only sources of knowing. Similarly, Hume labels induction as questionable but holds impressions or observations of particulars as the ultimate epistemic foundations. Neither the position of Carvaka nor the position of Hume can be sustained without OC.

One may object that appealing to OC does not quite get the job done. The point may be elaborated by looking again at the two claims that (1) smoke is produced by fire and (2) that smoke is produced without fire. (1) may involve simply claiming (1A) that smoke in the past and the present has been produced by fire and (2) may involve simply claiming (2A) that smoke in the past and the present has been produced without fire. As between these two empirical claims OC clearly favors (1A). Neither Carvaka nor Hume would also object to accepting (1A) in preference to (2A). However, (1) may also additionally involve claiming (1B) that smoke will be produced by fire and similarly, (2) may additionally involve claiming (2B) that smoke will be produced without fire. Clearly, (1B) does not logically follow from (1A). So a skeptic who accepts OC and also accepts (1A) does not thereby necessarily commit to accepting (2A) over (2B). Accordingly, the skeptic may still maintain that acceptance of (2A) over (2B) is on such irrational grounds as custom or habit. Thus, Carvaka or Hume may be interpreted as implying that knowledge claims should be confined to past and present observations (for Carvaka knowledge claims more

strictly speaking should be confined only to present observations) and should not be extended to the future. Claims about the future are not instances of knowledge but anticipations based on repeated observation.

But the skeptical claim is not simply that claims about the future are based on habit but also additionally that claims about the future cannot be possibly based on rational grounds. So a critic may agree with the skeptic that claims about the future are sometimes based on habit and still disagree with the skeptic that it is impossible for such claims to be based on rational grounds. An inductionist is certainly under no obligation to restrict OC to only factual claims about the past or the present. To remove any possible ambiguity and include factual claims about the future under the umbrella of OC the following strengthened version of OC or OC' may be offered: of two factual claims the one that has observational support is preferable to one that does not and in case of factual claims about the future the one that is homogeneous with an accepted factual claim is preferable to one that is heterogeneous. What is homogeneous and what is heterogeneous? A factual claim about the future is homogeneous with an accepted claim if the former can be derived from the latter merely by changing the tense of the latter from the past or the present to the future. On the other hand, a factual claim about the future is heterogeneous to an accepted claim if in order to be derived from an accepted claim at least an additional logical operator is needed over and above changing the tense. Such a heterogeneous claim is also homogeneous with a rejected claim. Thus factual claims that are homogeneous with accepted claims are preferable to ones that are heterogeneous and are homogeneous with a rejected claim. OC or OC' fit with the majority opinion of the scientific and scholarly community. The burden of proof is on Carvaka or Hume to show why these should be rejected and why it is preferable to have doubts based on claims that are homogeneous with rejected claims.

Does OC or OC' involve induction so that the Carvaka-Humean charge of infinite regress or circularity can be brought back? No. OC or OC' involves only mental reflection (*mānasa-jñāna*) on the nature of empiricism. Since no external observation is involved in mental reflection or analysis or unpacking of conceptual contents (*viṣayatā*), the charge of circularity or infinite regress is groundless.

Accordingly, claims about the future may be chosen on the basis of such a general principle of reason that is consistent with empiricism. This is irrespective of the question of the principle's fit with the particular (and self-refuting, as already argued) brand of empiricism of Carvaka or Hume. A healthy empiricism need not confine knowledge claims to only past or present observations. If the present is continually becoming the past and the future is continually becoming the present and no line can be drawn between the past, the

present and the future, can any observational reason be given for making exclusive knowledge claims about only the past or the present? In other words, if time is a continuum and if divisions within a continuum are relative, are there any consistently empiricist reasons to justify absolutistic claims with reference to a division within the continuum? If not, since future-oriented claims can be based on such a principle as OC or OC', the skeptical claim that such choice can only be based on anticipation or habit is refuted.

If this makes sense, the above argument of Gangesa is relevant so far as the critique of induction goes.[30] This does not make induction infallible (infallibility may be claimed for logical truths but is ruled out for induction in any case), but it (together with observation of positive instances or negative instances and nonobservation of any counterexample) does make it reliable (*prāmāṇika*). In Nyāya epistemology reliability is inferred from successful action (*saphala-pravṛtti*) prompted by a cognition (such as when a thirsty person looks for water, finds it, drinks it and the thirst is quenched) or its fit or coherence (*samvāda*) with other accepted truths.[31]

A skeptic may point out that the above reasoning involves at least the induction that a supposition that conflicts with accepted views is not reliable. Accordingly, the reasoning is circular, the skeptic may object. The skeptic may add that whatever reasoning is offered in support of induction would inevitably involve some induction and be invariably circular.[32]

But the assumption behind this objection is that if the same rule is involved in the justification of a given rule, the reasoning is circular.[33] This assumption is questionable, as argued earlier. Further, the skeptical claim that no argument can show the reliability of induction without presupposing that reliability itself involves induction and cannot be sustained without presupposing its reliability. Thus, if rule-circularity is a flaw, the skeptical objection is flawed too. In particular, if the reliability of induction cannot be challenged without presupposing that reliability, the challenge is futile.

Another response to the above objection involves a distinction between a meta-induction such as that a supposition which conflicts with accepted views is not reliable and a proper induction such as that all smoky things are fiery. The former is a second-order proposition relying primarily on conceptual analysis and mental reflection. The latter is a first-order proposition relying primarily on external observation. While the charge of circularity may be relevant if one relies on a proper induction in the process of justifying induction, it loses all force when applied to a meta-induction. Just as what applies to meta-logic does not necessarily (and in fact is not according to many expected to) apply to logic, what applies to meta-induction does not necessarily apply to induction.

If one overlooks the distinction between meta-induction and induction, one may be persuaded by Howson's argument that an inductive rule may, by

using a variant of the grue case, be shown to prove its own unreliability (HP 30–31). Suppose that an induction based on an inductive rule is right if it implies something true and wrong if it implies something false. Now suppose that an induction is "ring" if it is checked and right or not checked and wrong. It follows that an induction that is found to be right is also "ring." It also follows that if most checked inductions are "ring," most inductions are also "ring." But only a finite number can be checked, leaving the remaining potential infinity unchecked and, therefore, wrong. Thus most inductions based on an inductive rule turn out to be wrong. But the above argument is without teeth, for a grue-like exercise involving meta-induction proves nothing about induction proper.

The main point of the solution then is that a reliable induction should have the support of observation of positive instances or negative instances and nonobservation of any counterexample and also have the support of counterfactual reasoning so that the denial of the induction would lead to an undesirable consequence. The undesirable consequence may be a contradiction in action (such as if I speak aloud in so many words that I am dumb) or a practical conflict (such as belief-behavior conflict utilized in Gangesa's example discussed earlier) or conflict with something reliably accepted or accepting something that is uneconomical (*guru*).

Now let us look at the grue case. So far as the support from observation of at least one positive instance and nonobservation of any counterexample is concerned, both that all emeralds are green and that all emeralds are grue appear to have that support. But there is a difference when it comes to the support from counterfactual reasoning. Suppose that "all emeralds are green" is false and that the next emerald to be seen is not green. Then that emerald will not complement red, for only green complements red. But the next emerald may be observed to complement red and that would conflict with the supposition that it is not green. Thus the assumed denial of the induction that all emeralds are green has the undesirable consequence that it invites the risk of conflict with what may be observed in the next case. Now suppose that "all emeralds are grue" is false and that the next emerald to be seen is not blue. No undesirable consequence follows. Even if the next emerald is observed to complement red, there is an incongruence: something not blue may complement red. Hence "all emeralds are grue" fails to qualify as a reliable induction.

Further, compared to grue green is simpler with respect to constitution (*sarira*)—that is, grue appears to contain more concepts than green. Compared to grue there is also greater economy in the cognitive link/order (*upasthiti*) so far as ordinary discourse is concerned: in ordinary discourse awareness of grue cannot take place without awareness of green; but awareness of green can take place without awareness of grue. [In the light of Nyāya ontol-

ogy there will be moreover greater economy in relationship (*sambandha*). But exploration of Nyāya ontology will take much space here and must be skipped.] So green is preferable to grue in terms of the principles of economy (*lāghava*) as well.

It may be noted that Gilbert Harman has argued that "all emeralds are green" is preferable to "all emeralds are grue" because the green hypothesis is more economical or simpler than the grue one.[34] Harman has proposed a computational or pragmatic theory of simplicity according to which ease of computation is the basis of preference among competing and equally relevant hypotheses. That is, theories that are easier to use in getting results in which scientists are interested are preferable to those that are harder to use in getting those results. This is somewhat similar to a part of the Nyāya solution. But Harman does not explicitly recognize the subtle distinction between the three kinds of simplicity as the Nyāya does.[35] Further, the Nyāya does not rely on simplicity alone and holds, as already said, that an undesirable consequence may be due to belief-behavior conflict or conflict with something reliably accepted (e.g., that fire is cold is liable to be rejected on the ground that fire is directly observed to be hot) and so on. This is an important difference between the Nyāya and Harman and other proponents of a simplicity solution. Although simplicity may sometimes help to determine what is reliable or true, relying on simplicity alone may not suffice to show that we are getting any closer to truth or reliability. That is, what still needs to be argued for is that the fact that one theory is simpler than another is a good reason for saying that the former is more likely to be true or reliable than the latter.[36] This issue is implicitly addressed in the Nyāya solution. That the denial of a hypothesis conflicts with something reliably accepted or conflicts with the way one regularly behaves may (among others) be offered as good reasons to think that the hypothesis is likely to be true or reliable.[37]

Further, unlike Quine's position, the Nyāya solution does not hinge on deciding which predicate represents a kind and which predicate does not—a task that appears to be fraught with difficulties to say the least. Again, unlike Goodman's position this solution is not pinned down to checking the past history of how often a particular predicate has been projected and does not leave the choice between two predicates to counting which predicate (along with coextensive or parent or comparable predicates) has been projected more often in the past. So the test that an induction is not reliable unless the assumed denial leads to an undesirable consequence, does not leave the progress of science to luck and does not forbid the introduction of new predicates. The undesirable consequence may also result from future developments. An induction that passes the test now may fail it in the future. There are no guarantees in nature. Since Gangesa is a fallibilist, he does not also try to find one.

Finally, David Sanford has argued that since grue is a disjunctive predicate and green is not, a part of the solution may be found in a clearer, objective and semantic (as distinguished from a merely syntactic) analysis of disjunctiveness that Sanford has offered.[38] He also notes that while in the predicate grue there is a link between a color term and a temporal term, terms that are semantically disconnected, there is no such linking of what are semantically disconnected in the predicate green. It is remarkable that Gangesa too has cited a problematic property that includes disjunction of semantically disconnected terms like the hill and where absence of the probandum is known.

But it should be added that Gangesa has also shown (TC, chapter on *Upādhi*, 301) that other properties that are not disjunctive such as "not being the inferential subject (bois: *pakṣetara*)" turn out to be equally problematic and may be handled in the same way explained above. Thus bois appears to pervade the probandum, for no positive instance where the probandum is known to be present is the inferential subject. Bois cannot be also true of the inferential subject and it seems to follow that the probandum does not belong to the inferential subject no matter what is offered as the probans. In inference of unobserved fire in the hill from observed smoke, bois amounts to "not being the hill." Since fire is not observed in the hill, "not being the hill" appears to pervade fire. At the same time since "not being the hill" cannot be true of the hill, it appears to follow that fire does not belong to the hill no matter whether smoke or something else is found in the hill. Gangesa discusses the problem at length but one of his main points is as follows. Bois does not reliably pervade the probandum for the lack of CR that would obstruct the doubt over that induction. Since the probandum may be present in the inferential subject and since bois is necessarily missing in the inferential subject, there remains the lingering doubt that bois may not pervade the probandum.[39]

If this makes sense, since bois is not disjunctive, disjunctiveness may not have a crucial role in the present issue. But Sanford's point is also that perverse predicates like grue are formed by linking terms that are semantically disconnected. This holds of the overtly nondisjunctive properties cited by Gangesa. For example, bois links by implication terms like "the hill" with terms like "where typically neither presence nor absence of the probandum is known" and, therefore, are formed by linking terms that are semantically disconnected. Since grue-like predicates link terms that are semantically disconnected, they would also be more complex with respect to constitution (*śarīra*), cognitive order (*upasthiti*) and relation (*sambandha*) compared to predicates like "green" or "fire" that do not link terms that are semantically disconnected. Further, since grue-like predicates link terms that are semantically disconnected, the hypotheses concerned would be without support from counterfactual reasoning and their denial would not lead to an undesirable consequence.[40]

NOTES

1. See K. Chakrabarti, "Some Remarks on Indian Theories of Truth," *Journal of Indian Philosophy*, XII, 1984, 339–55.

2. TS 378. It may be noted in this connection that some recent philosophers like Nelson Goodman in his *Fact, Fiction and Forecast* (FFF) (Harvard University Press, Cambridge, fourth ed., 1983) have regarded the problem of induction and the problem of the justification of counterfactual statements as merely two complementary ways of looking at the same thing. This is analogous to the Nyāya view that exploration of counterfactuals is relevant to the rationality of induction. In the Nyāya view the falsity of a counterfactual is no bar to its being conducive to truth. Further, while a false induction could fail an empirical test, a counterfactual by its nature can never be subjected to any empirical test by realizing its antecedent. However, a proper discussion would require making deeper inroads into Nyāya epistemology that is beyond the scope of this study.

3. TS 69.

4. An alternative translation requiring a change, *mutatis mutandis*, in the reformulated version given below is as follows: if smoke were not produced by what is not collocated with fire and were not also produced by what is collocated with fire, it would not have been produced.

5. An alternative reformulation of the above argument with complex terms is also possible. For a discussion of the relevant ambiguity of Sanskrit texts, see K. Chakrabarti, "Some Non-Syllogistic Forms in Early Nyāya Logic," *Proceedings of the Fifth International Congress of Logic, Philosophy and Methodology of Science*, Ontario, 1975, section 12, 9–11.

6. John Anderson, "The Problem of Causality," *Australasian Journal of Psychology and Philosophy*, 16, 1939; cited in J. L. Mackie, *The Cement of the Universe*, Clarendon Press, Oxford, 1974, 35, footnote.

7. NK 9–12.

8. Udayana allows the admission of nonempirical causal conditions like God only if empirical causal conditions are not available.

9. NK 13–22. Hume too says that where several different things produce the same effect, it must be by means of some common quality in them; he also holds that the difference in the effects of two resembling things must proceed from that particular in which they differ (*Treatise* I, iii, 15).

10. See K. Chakrabarti, "Nyāya-Vaiśeṣika Theory of Universals," *Journal of Indian Philosophy*, III, 1975, 363–82.

11. For the Nyāya theory of truth, see "Some Remarks on Indian Theories of Truth," *op cit*.

12. See, for example, Nicholas Rescher, *Induction*, University of Pittsburg Press, Pittsburgh, 1980, 119.

13. This objection has been raised by Sriharsa (twelfth century) in the *Khaṇḍanakhaṇḍakhādya*, Chowkhamba Vidyabhavan, Varanasi, 1992, 386. More discussion on this follows later. Needless to say that Hume would agree with Sriharsa.

14. Don Garrett makes these points in *Cognition and Commitment in Hume's Philosophy*, Oxford University Press, Oxford, 1997, chapters 4 and 10.

15. See “Some Remarks on Indian Theories of Truth,” *op cit.*

16. Descartes, *Meditations on First Philosophy*, translated by D. A. Cress, Hackett Publishing Co., Indianapolis, 24.

17. ATV 533.

18. See “Some Remarks on Indian Theories of Truth,” *op. cit.*

19. *Ibid.*

20. TC 230–51.

21. Useful discussion of the Nyāya view and some other Indian views on the classical problem of induction is found in S. S. Bagchi, *Inductive Reasoning*, University of Calcutta Press, Calcutta, 1949 (which, though somewhat dated, gives the best coverage of a vast body of Sanskrit material); E. A. Solomon, *Indian Dialectics*, vols. 1 and 2; Gujarat Vidya Sabha, *Ahmedabad*, 1976; and Raghunath Ghosh, *The Justification of Inference*, Bharatiya Vidya Prakashan, Delhi, 1990.

22. *Fact, Fiction and Forecast*, abbreviated as FFF, chapter III.

23. Goodman himself holds that the classical Humean problem of induction has generated much fruitless discussion and should be dissolved (FFF, chapter III). But we shall see that Goodman’s own solution to the new riddle is vulnerable to the Humean critique. However, see note 39 below for the point that elsewhere Goodman comes close to the Nyāya solution.

24. FFF, 94.

25. FFF, chapter IV.

26. Quine, W. V., “Natural Kinds,” in *Grue!* (GR), ed. Douglas Stalker, Open Court, Chicago, 1994, 41–56.

27. *Pakṣa-vipakṣa-anyatara-anyah yathā prasiddha-anumāne parvata-jalahṛada-anyatara-anyatvam*: “not being either the inferential subject or a negative instance” (is a pseudo-adjunct or pseudo-property, *upādhyābhāsa*), for example, “not being either the hill or a watery lake” with reference to the stock inference (of fire from smoke in a hill), *Tattvacintāmaṇi* (TC) of Gangesa, ed. K. N. Tarkavagisa, vol. II, Chowkhamba Sanskrit Pratisthan, Delhi, 1990, 403–4.

28. *Tatra anukūla-tarka-abhāvena sādhya-vyāpakatva-aniścayāt sahacāra-darśānadeh tena vinā samśāyakatvāt*: due to the lack of supportive CR pervasion of the probandum (by the said property) is uncertain; without that (CR) observation of co-presence and so on is subject to doubt (i.e., is a doubtful base for the inductive claim) (TC 355).

29. *Dhūmo yadi vahni-asamavahita-ajanyatve sati vahni-samavahita-ajanyah syāt, notpannah syāt* (TC 219). The argument has another important part utilizing in particular belief-behavior conflict that we have discussed earlier.

30. For a discussion of difficulties in various attempted solutions to the classical problem of induction and how this solution differs from them and avoids those difficulties, see preceding discussion.

31. For further discussion see Chakrabarti, Kisor, “Some Remarks on Indian Theories of Truth,” *op cit.*

32. This objection has been raised by Sriharsa (twelfth century) in his *Khaṇḍanakhaṇḍakhādya*, Chowkhamba Vidyabhavan, Varanasi, 1992, 386.

33. This kind of circularity is sometimes called rule-circularity. See Rescher, Nicholas, *Induction*, University of Pittsburgh Press, Pittsburgh, 1980.

34. "Simplicity as a Pragmatic Criterion for Deciding What Hypotheses to Take Seriously" in GR 153–72.

35. Harman does mention simplicity of representation that is similar to what is called economy with respect to constitution in the Nyāya. He also distinguishes computational simplicity from semantic simplicity advocated by Elliott Sober in *Simplicity*, Oxford University Press, Oxford, 1975. According to Sober, a hypothesis is simpler and preferable to another if less information is needed in the light of the former compared to the latter to answer questions that matter.

36. Another kind of undesirable consequence, as already mentioned, is due to contradiction in action, (e.g., in speaking aloud that I am dumb). Yet another kind of undesirable consequence is due to conflict between what one asserts and the way one regularly behaves.

37. Harman tries to show that computational simplicity is an indicator of verisimilitude. He, however, assumes in this process that there is no difference between believing something and believing that it is true. This assumption is questionable: believing something without believing that it is true seems to be quite possible. For example, a man of science may participate in religious rituals in the belief that this is needed for afterlife although he has also reason to believe that science rejects life after death. At least the Nyāya claims that it is psychologically possible to hold on to a contradiction in spite of being aware of that it is a contradiction.

38. "A Grue Thought in a Bleen Shade: 'Grue' as a Disjunctive Predicate," in GR 173–92.

39. D. H. H. Ingalls, who taught at the Harvard University where Goodman too taught, was trained in Nyāya philosophy by a traditional pundit in Kolkata. Goodman makes no reference to the Nyāya anywhere. Still, it is possible that Goodman and Ingalls had some philosophical conversations. It is also possible that Goodman met B. K. Matilal, a leading specialist in Nyāya philosophy trained by pundits in Kolkata, who spent a few years at Harvard and that Goodman was influenced by Nyāya ideas in coining perverse predicates like the grue. Goodman holds: "A hypothesis is *projectible* if and only if it is supported, unviolated, and unexhausted, and all such hypotheses that conflict with it are overridden" (*Problems and Projects*, Bobbs-Merrill, Indianapolis, 1972, 393). This is analogous to the Nyāya view that an induction (or a hypothesis: *kalpanā*) is not reliable unless it is supported by subjunctive reasoning that shows that the denial leads to an undesirable consequence. As already said, the Nyāya theory of undesirable consequence is highly developed. An undesirable consequence may be a contradiction or a belief-behavior conflict or a conflict with something reliably accepted or acceptance of something uneconomical.

40. In an interesting article Stephen Hetherington has offered a solution of the Goodman paradox by drawing attention to the psychological nature of the evidence on which induction is founded. More specifically, Hetherington draws a distinction between experience-*of* and experience-*as* and suggests that one's experience could be *of* a thing being green without one's experiencing that thing *as* being green. Accordingly, whether one would generalize from the observation of emeralds that all emeralds are green or rather that all emeralds are grue would turn on whether one experiences emeralds as green or rather as grue. This avoids, Hetherington suggests, having

to say that for a particular subject the same observation may be evidence for both that all emeralds are green and that all emeralds are grue. (S. Hetherington, "Why There Need Not Be Any Grue Problem About Inductive Evidence As Such," *Philosophy* 76, 2001, 127–36.) But then the reliability of a scientific law or induction would have to hinge on the psychological nature of a particular subject. While a given subject may experience emeralds as green another subject may experience them as grue. Accordingly, for the former subject all emeralds may be green and for the latter subject all emeralds may be grue. Further, there is nothing to rule out the possibility that even the same subject may experience emeralds as green until now and then from now on experience emeralds as grue. For such a subject there would then be evidence for both that all emeralds are green and that all emeralds are grue. The underlying idea seems to be that a normal subject would experience emeralds as green rather than as grue. But then one would need a criterion to distinguish a normal subject from an abnormal subject. If normalcy is defined in terms of agreement with most observers, induction is presupposed; the charge of begging the question then looms large.

3

The Method of Generalization: *Vyāptigrahopāyah*

Text. *Seyam vyāptirna bhūyodarśanagamyā darśanānām pratyekam ahetutvāt āśuvināśinām kramikāṇām melakābhāvāt. Na ca tāvaddarśanajanyasamskāra indriyasahakṛta vyāptidhihetavah pratyavijñāyām indriyasya tathātvakalpanaāditi vācyam. Sāmānaviṣaye smaraṇe pratyabhijñāne ca samskāro hetu atah katham samskāreṇa vyāptijñānam janyeta, anyathātiprasañgah.* (174–75)

Tran. Such pervasion is not known through multiple observations. For each observation by itself does not provide the ground; further, there is no connector of the observations whether fleeting or successive. Objection: The impressions left by the observations together with the sense organ are the causal conditions of the awareness of pervasion. Indeed, it is hypothesized that a sense organ has a similar (causal role) in recognitive perception (*pratyavijñā*). Reply: An impression serves as a causal condition of a remembrance or a recognitive perception when the object is the same. How can then an impression produce awareness of pervasion? Otherwise, unwelcome consequences follow.

Gangesa begins the discussion of the method of generalization. The discussion is important, for general premises play an indispensable role in the paradigmatic inference called the *nyāya*. In particular, Carvaka philosophers hold that there is no reliable method of generalization and, therefore, the *nyāya* for which general premises are indispensable, is not a reliable method of knowing (*pramāṇa*). Since Gangesa upholds reliability of the *nyāya*, a response is necessary. However, Gangesa begins by first presenting the Mīmāmsā view on the subject. Gangesa is here in the introductory section a spokesman for the Mīmāmsā; although he develops the Mīmāmsā view carefully and rigorously, the ensuing discussion does not necessarily in each case reflect his own position. The Mīmāmsā is critical of an old Nyāya (*jaran-naiyāyika*) view of the

method of generalization that Gangesa too does not hold. Gangesa explains how the Mīmāmsā has refuted the old Nyāya view to build the case for the Mīmāmsā view of the method of generalization. Then Gengesa offers objections to the Mīmāmsā view, so that both the Mīmāmsā view and the old Nyāya view stand refuted. Gangesa ends with the presentation of his own view. As GD says, Gangesa goes through this exercise because refutation of other views is relevant. [*Tathā ca svānabhimata-nirākaraṇasyāpi uddeśyatayā pracīna-naiyāyikābhimatam bhūyodarśanasya vyāpti-grāhakatām nirākurvanasya gurormatam upanyasya tadvyavasthāpitayā vyāpteh sakṛddarśana-gamyatayā nirākaraṇena svanibhimatam ubhayameva nirākaṛam bhavatīti gurumatamasrtya prathamam pracīna-naiyāyika-mata-nirākaraṇam ārabdham*, GD 639]

A stock example of pervasion is that wherever there is smoke there is fire. One might suppose, like the old Nyāya, that this may be perceptually known from observing many cases where smoke is found together with fire. If so, it may be asked whether each individual (*pratyekam*) observation suffices for awareness of pervasion. Against this position it is argued that each such observation by itself does not suffice for the purpose; for each such case only provides evidence that a particular smoke is together with a particular fire, and this falls short of the claim that all smoky things are fiery. Accordingly, such a particular observation cannot be a causal condition (*hetu*) of perception of pervasion, for it does not invariably and immediately precede the perception of pervasion, as JD points out. [*Tathā ca tat-tat-sahacāra-darśanatvam na vyāpti-graha-janakatāvacchedakam tanniyata-pūrvavarttitānavacchedakatvāt*, JD 362.] That is, in spite of the presence of such an individual observation along with other requisite conditions, the perception of pervasion may not follow. This shows violation of the rule of co-presence (*anvaya-vyabhicāra*, MN 175). In other words, something is a causal condition only if its presence, along with other requisite conditions, is a sufficient condition for the origin of the effect. This does not hold here. What if one says that something may be a causal condition in spite of the violation of the rule of co-presence? That is, what is the harm if a particular observation is accepted as the causal condition of generalization even if the latter does not take place in spite of the presence of the former? But that would require an inquiry into and discovery of something else, the presence of which is necessary for origin of the effect. Then the latter renders the former dispensable (*anyathāsiddha*). [*Na ca anvaya-vyabhicārasya . . . na kāraṇatā-vighatakatvam iti vācyam. Sahacāra-darśana-sattve api phala-anutpādena tat-prayojaka-abhāva-pratiyogi-kāraṇāntaram avaśysam amgīkāryam. Tathā sati tenaiva sahacāra-darśana-anyathāsiddhi*, GD 639]

Even if such an individual observation fails to be a causal condition, the collection of many such observations may still suffice for the purpose. The pos-

sibility of such a collection is not ruled out, as RS remarks. At least impressions of observations are enduring and could be collected even if they are successive (*kramika*). Further, even if such observations are fleeting, many of them could take place at the same time and could thus be collected. [*Kramikāṇāmapi sthirāṇām asthirāṇāmapi sahotpannānām milanam asti*, 361–62.] Moreover, even if such observations are fleeting and cannot be collected when they are not contemporaneous, they could still be collected by way of the causal operation (*vyāpara*) that is enduring. For example, such observations may leave behind lasting impressions (*samskāra*) and could be all connected to the effect through such impressions. But, Gangesa argues, such a collection is still not a causal condition for lack of a proper connection. That is, perception of pervasion may take place without such a collection (to be explained below). This shows violation of the rule of co-absence (*vyatireka-vyabhicāra*, MN 175). That is, a causal condition is a necessary condition and the effect does not take place even if other requisite conditions are present and that condition is absent.

One could suppose that since the observations have left behind their impressions, the sense organ could serve as the causal condition of the perceptual grasp of pervasion with the help of such impressions. Indeed, in a recognitive perception (such as this is that ring) a sense organ serves as a causal condition with the help of the impression of the previous perception. But this is not acceptable. When an impression leads to a remembrance or a recognitive perception, it leads to awareness of the same object. But the object of impression is different from what is grasped in pervasion. The object of each impression is, say, that a particular smoke is together with a particular fire. But what is grasped in a pervasion is that all smoke-possessing things are fire-possessing. Thus the analogy with recognitive perception fails: the thing grasped in recognitive perception is something particular—indeed, the very thing that has been seen before and that left behind the impression. Similarly, what is grasped in each observation and becomes the content of each impression is a particular truth, but what is grasped in pervasion is a general truth. Indeed, pervasion may be explained as co-location of the probans with the probandum that pervades. This co-location with the probandum is already known from previous observation of the probans together with the probandum. So what remains to be known from impressions of previous observations is that the probandum pervades. But this is not possible, for the impressions are about something else, viz., co-location of a particular smoke with a particular fire. [*Vyāpaka-sādhya-sāmānādhikaraṇyātmikāyām vyāptau sādhya-sāmānādhikaraṇyāmśasya prathamameva gṛhītatvāt agṛhīta-vyāpakatvāmśa-grahe sahacāra-darśana-janya-samskārāṇām hetutvam vācyam; tacca na sambhavati, bhinna-viṣayakatvāt*, RS in GD 641.]

One may object that when an impression becomes a causal condition of a recognitive perception, there is discrepancy between the contents of the former and the latter. Recognitive perception includes among its contents thisness (*idantā*) that is not a content of the impression. Similarly, impressions may lead to grasp of pervasion in spite of the discrepancy in the contents. [*Tatra ca yadi samskāra-janya-jñānam avaşyam sva-janaka-samskāra-avişaya-avişayakamiti kathita-niyamārthah tadā pratyabhijñā-janaka-samskāra-avişayedantvasya pratyabhijñā-vişyatayā vyabhicārat*, GD 641] But in recognitive perception and other cases the chief qualificand (*mukhya-viśeşya*) of the resultant awareness and that of the impression remains the same. [*samskāra-janyam yajjñānam tat sva-janaka-samskāra-visaya-mukhya-viśeşyakameva*, GD 642.] This is not true of impressions and awareness of pervasion.

What if it is denied that the object of the impression and that of the remembrance or the recognitive perception should be the same? That is, what is the harm if the impression of one thing is held to cause the remembrance of another thing? That would lead, Gangesa says, to the unacceptable consequence that even an impression of, say, a pot could routinely lead to the remembrance of, say, a cloth, and so on [*eka-vişayaka-samskārasyāpi anya-vişayaka-jñāna-janakatve . . . ghatādi-gocara-samskārādapi patādi-gocara-jñāna-janana-prasangah*, MN 176–77].

Text. *Kimca sambandhabhūyodarśanam bhūyahsu sthāneşu bhūyasām vā darśanam bhūyāmsi vā darśanāni na yathā ekatra rūparasayoh dravyatvaghatatvayośca vyāptigrahāt ekatraiva dhārāvahike taddhīprasañgāt bhūyastvasya tricaturāditvena ananugamācca. Api ca pārthivatvalohalekhyatvādau śataśo darśane api vyāptyagrahāt.* (175–77)

Tran. And if multiple observations of the relation (of togetherness of the pervaded and the pervader) mean the observations in many places or multiplicity of what is observed or multiplicity of the observations, none is the case. For example, the pervasion between color and taste or that between substanceness and potness may be grasped in one place (without having recourse to observations in many places). Further, there is possibility of awareness of that (viz., pervasion) in one place alone in the case of a continuing stream (of observations). And multiplicity could mean three or four things and so on and is accordingly non-uniform. Moreover, in cases such as being made of earth and being pierceable by (a piece of metal such as) iron, pervasion is disconfirmed in spite of confirmation in hundreds of observations.

The concept of multiple observations may be analyzed in three different ways. (1) It could mean observations in many different locations. That is, one should not generalize to the claim that all *a* is *b* merely from one observation in one situation but should have recourse to observations in a variety of situ-

ations. This is a plausible view; but it is open to the following objection. In some cases the very possibility of observations in a variety of situations is ruled out. For example, one may hold, as the Vaiśeṣika philosophers do, that there are unrepeated particular colors, tastes and so on (besides universal redness, blueness, colorness and so on). Then one may generalize that wherever there is this particular color of this pot there is this particular taste of this pot. [*Etadghatavṛtti-rūpavān etadghata-vṛtti-rasāt*, MN 177] This generalization cannot be disconfirmed from the very nature of the case, for neither this particular color nor this particular taste is found anywhere else. So the generalization is permissible, although the possibility of observations in a variety of situations or places is ruled out.

Second, in some cases one observation in one situation may suffice for the generalization. For example, take the general claim that all pots are substances. Since the pervaded and the pervader in this case are related as a species to a genus, no further observations in a variety of situations is needed, for the pervasion follows from the said genus-species relation itself. This case differs from the first where the possibility of observations in other situations is ruled out. In this second case the possibility of observations in other cases is not ruled out; but it is still unnecessary.

Third, there is possibility of multiple observations in one situation. For example, co-presence of smoke and fire may be observed again and again in the same kitchen in a continuous flow of observations. What if this too is held to provide a possible basis for the general claim that all smoky things are fiery? Accordingly, for the reasons above, the thesis that pervasion can be known only from observations in a variety of situations must be rejected.

(2) A second possible construal of multiple observations is the multiplicity of what is observed. But then what is multiplicity? Is it the observation of three smoky things or four smoky things and so on? It is clear that no specific number can be given that would work for all cases. The resulting vagueness would make it difficult to determine whether the requisite condition has been fulfilled in a given case of generalization.

(3) A third possible construal of multiple observations is the multiplicity of the observations themselves. This differs from the first construal where the emphasis is on the multiplicity or variety of the situations or places in which the observations take place. (Since Sanskrit philosophical works are written in a compact style, such points as what precisely is the difference between one or more alternatives are not usually explicitly stated in the texts themselves and are usually left to the reader to figure out.) The third interpretation is also open to objection. The mere fact that co-presence or co-absence has been observed in numerous cases does not make a generalization acceptable. A

generalization may be false in spite of being confirmed in hundreds of cases. For example, it is commonly observed that an earthen substance such as a pot may be pierced by a piece of iron. But it is still false that all earthen substances can be pierced by a piece of iron, for a diamond is an earthen substance and it cannot usually be pierced by a piece iron. It thus appears that the thesis that multiple observation is the proper method of generalization is open to objection in any of the above three interpretations.

Text. *Tarkasahakṛtam tatheti cet, tarhi sahacāradarśanasahakṛtah sa eva vyāptigrāhakah astu āvaśyakatvāt kim bhūyodarśanena. Na ca tena vinā tarka eva nāvatarati, prathamadarśane vyutpannasya tarka-sambhavāt.* (177–78)

Tran. Suppose such is the case when aided by counterfactual reasoning. [That is, suppose that not multiple observation alone but multiple observation and counterfactual reasoning (CR) together are the proper methods of generalization.] But then let that, being necessary, when aided by the observation of co-presence, be the method of generalization. What is the need for multiple observations? Not that counterfactual reasoning itself is not possible without that, for someone knowledgeable may have recourse to counterfactual reasoning after the first observation (of co-presence).

It has been argued above that multiple observations alone are not the proper method of generalization. The proposal now is that multiple observations are still an important ingredient in the method of generalization, the remaining ingredient being CR. In CR that incorporates an indirect reasoning one supposes the opposite of one's thesis to be true. If the supposition leads to something undesirable, the supposition is rejected and the thesis is supported. (See the first two chapters for examples and discussion.)

RS interprets the view as that CR as aided by nonperception (or non-awareness) of deviation and perception (or awareness) of co-presence is the causal condition of awareness of pervasion. Although nonperception of deviation is necessary, that does not make CR dispensable, for such nonperception may be regarded as the causal operation (*vyāpara*) and something is not rendered dispensable by the causal operation [*Vyabhicārādarśanam vyāparatayā sahakārīi vyabhicārādarśana-sahakṛtastarka eva vyāpti-grāhakah*, RS 364; *vyabhicārādarśanasya āvaśyakatve tenaiva anyathāsiddhastarkah katham hetuh syāt . . . vyāpareṇa vyāpāriṇo nānyathāsiddhih*, JD 364]. When something is an effect of something and is also in turn a causal condition of something else of which the latter is a causal condition, the former is called a causal operation of the latter. For example, contact between an axe and a piece of wood is an effect of the axe and also a causal condition of the cutting of the piece of wood which cutting is an effect of the axe; hence the contact between the axe and the piece of wood is the causal operation of the axe. Similarly,

nonperception of deviation may follow CR and precede perception of pervasion and thus be described as the causal operation.

The proposal that multiple observations and CR together are the proper methods of generalization is not satisfactory: to suppose that observation of co-presence and CR together are the methods of generalization is more economical: the latter does not commit oneself to the claim that more than one observation is necessary for generalization. It has been shown above that generalization from a single observation is possible. Thus it is more economical to suppose that observation of co-presence (that may be single or numerous) and CR are the methods of generalization.

The supporter of multiple observations may argue that multiple observations are still necessary for CR. In the stock example there are such steps as that fire is a causal condition of smoke. Causal connection cannot be known from a single observation and multiple observations are needed for discovering causal connection, so multiple observations remain indispensable for generalization.

This argument is rejected on the ground that for knowledgeable persons CR is possible from a single observation. One with background information may discover causal connection from a single observation and proceed with all the needed steps of CR. Even if multiple observation is necessary for background information, that would still make multiple observation too remote and not count among the causal conditions for generalization. This takes into account that multiple observations may be necessary for CR in some cases. Still, since it is not necessary in all cases, it should not count as a causal condition.

> Text. *Na ca evamastu, tarkasya vyāptigrahamūlakatvena anavasthānāt. Jātamātrasya pravṛttinivṛttihetvanumitijanakavyāptijñānam tarkam vinā eva atah na anvasthā iti cet, tarhi vyabhicārāt sah api na vyāptigrahe hetuh*. (178–87)

> Tran. Not that let it be so. Since CR presupposes awareness of pervasion, there is infinite regress. Objection: There is awareness of pervasion that leads to inference that serves as the ground of the effort of a newborn for acquiring or refraining from something. (Such awareness of pervasion) is without CR. Therefore, there is no infinite regress. Reply: Then, since there is deviation, that (CR) too is not a necessary condition of generalization.

Immediately above we have the view that multiple observations and CR are the proper grounds of generalization, and the criticism of it. Now we have the view that observation of co-presence and CR together are the proper grounds of generalization, and the criticism of it. Since multiple observations are not always necessary and since generalization is possible in some cases from a single observation, this latter view is more acceptable

than the immediately preceding one. Still, this latter view is open to objection. The trouble is that CR presupposes pervasion. In the stock example of CR we supposed that there is smoke without fire. This led to that fire is not a causal condition of smoke. This is false, for it is known that fire is a causal condition of smoke. [Gangesa has more to say on this later.] But that fire is a causal condition of smoke involves a generalization such as that all smokes are caused by fire. This is illustrative and helps us to see that a causal or some other general foundation is necessary to bring out the undesirable consequence in any CR. If, however, CR presupposes generalization, it follows that a given generalization is preceded by a given CR and the latter is preceded by another generalization and so on to infinity. Since this view leads to such vicious infinite regress, it is rejected.

Alternatively, we have here the view that observation of co-presence, nonobservation of deviation and CR together are the proper grounds of generalization, and the criticism of it. In spite of the added condition of nonobservation of deviation the basic difficulty arising from CR itself presupposing generalization and thus opening the door of vicious infinite regress remains the same. Hence this too is rejected.

An objector argues that the above view does not generate vicious infinite regress. There are cases of awareness of pervasion that are not preceded by CR. As an example, the objector cites the inference that leads to such instinctive actions as a newborn mammal suckling its mother's breast for the first time. According to the objector, such suckling is a voluntary action. Like any other voluntary action, such suckling must be preceded by the anticipatory inference that the result of the action is beneficial. The admission of such anticipatory inference is in order. There is no undisputed case where a voluntary action is not preceded by awareness that the result of the action is beneficial. There are also countless confirming cases where a voluntary action is preceded by awareness that the result of the action is beneficial. Hence the voluntary action of the newborn should also be preceded by such awareness. One may question whether such act of a newborn is voluntary. But in the objector's view such act is indeed voluntary. It is an act of consumption of food that is considered to be voluntary in every other known case and should also, based on the similarity of the observed behavior, be taken to be voluntary in the case of the newborn. Now suppose that it is reasonable to credit a newborn with such inference. This inference is based on a certain generalization. There is no evidence, however, that a newborn has also gone through CR to come up with the generalization. So no such assumption should be made. This then is a case of a generalization that is not preceded by CR. The infinite regress thus is avoided. CR may be needed for generalization in some cases. But it is not needed in all cases.

By way of reply, it is said that even if the objector is right, it only shows that CR is not a necessary condition of generalization. Hence the above view remains open to refutation.

It could also be observed that if CR is a necessary condition for induction, the case of a newborn mammal does not necessarily invalidate it. One could then suppose that the CR needed for the newborn's induction was done in a previous life. But such a supposition would invariably open the door of infinite regress as RS points out. RS observes that the appeal to the action of the newborn does not actually succeed in avoiding infinite regress, for it only pushes the matter back to a previous life and so on to infinity [*Na ca janmāntarīṇah sah, janmāntare api paryanuyoga-tādavasthyāt*, RS in JD 365].

What if it is held that CR is necessary only for perception of pervasion and not for remembrance of it? Since for a newborn it can only be a case of remembrance, the regress may then be stopped. RS argues that the infinite regress is not avoided even then, for remembrance presupposes perception [*Na ca vyāpti-pratyakṣam prati tarko hetustattu smaraṇamiti na vyabhicārāvakaśah, vinā anubhavam smarṇāyogāt*, RS in JD 365].

What if it is held that awareness of pervasion in a previous life may be linguistic (*śābda*) and, since linguistic awareness does not presuppose CR, infinite regress is avoided? JD argues that even then such linguistic awareness would presuppose awareness of fitness (*yogyatā*) that in its turn would presuppose awareness of some pervasion and the latter, another CR; so the regress remains unstoppable [*Yadyapi . . . śābda eva janmaāntare tarka-mūla-vyāptyanubhavah sambhavati tasya ca pratyakṣa-bhinnatvāt na tarkāntara-sāpekṣatvamiti anavasthā-śamkā api na, tathāpi vyāpteh tādṛśa-śābda-bodham prati yogyatā-jñāna-vidhayā vyāpti-jñānāntarāekṣāyām tadupayukta-tarkamādāya paryanuyogah*, JD 365].

What if it is argued that the causal regress is infinite as it is in the accepted infinite regress of a tree coming from a fruit that too comes from another tree that still comes from yet another fruit and so on? So the infinite regress involving CR and awareness of pervasion is also acceptable [*Nanu iyamanavasthā na doṣāya, janma-pravāhasya anāditayā, . . . anyathā bījāmkura-sthalīya anavasthayāapi doṣatvāpatteh*, GD 646].

But there is an important difference between the case of the tree and the seed and that of CR. It is generally accepted that a tree comes from a seed and a seed comes from a tree. So the infinite regress is offered as the best available explanation of what is generally accepted. But it is disputed whether CR is needed for awareness of pervasion. In fact, one could hold, as Gangesa himself does and would explain soon, that there are cases where CR is not needed. If CR is not needed in each and every case of pervasion, the very admission of CR as a causal condition of pervasion is in jeopardy; hence the above infinite

regress is unacceptable [*Tathāca vyabhicārāt tarkasya hetutvāsiddhau tadanuruddham anāditvam sudūra-parāhatam*, JD 366].

Text. *Na ca tadbuddhau avāntarajātirasti, sāmānyapratyāsattyā sarvopasamhārāt avināhāvagrahah, sāmānyarūpatā ca sakṛddarśanagamyeti bhyūodarśanāpekṣeti cet. Na. Sāmānyasya hi pratyāsattitvam lāghavāt na tu sāmānyatayā jñātasya tadanabhyupagamācca*. (187)

Tran. It is not that there is a subordinate species in that kind of awareness, for nondeviation is grasped by way of reaching out to all (pervaders and things pervaded) with the help of a universal character as the sensory connection. Since, however, being of the nature of a universal cannot be grasped in a single act of observing, there is still need for multiple observation. Not so. That a universal is (recognized as) a sensory connection is due to economy and not due to being known as a universal; indeed the latter is not admitted.

One may say that the cases of generalization that require CR as a causal condition should be distinguished from those that do not. Then the former could be regarded as a subordinate species of generalizations, viz., generalizations that are due to CR. Thus CR turns out to be a necessary condition for at least a subclass of generalizations.

But for this to be accepted one must make the case that CR is a necessary condition for some types of generalization. Since that case has not been made, the admission of a subordinate class of generalizations for which CR is a necessary condition is unsubstantiated.

One may hold that such generalizations as that all smoky things are fiery are perceptual truths. If this is so, the question arises, since no perception is possible without sensory connection, as to what is the sensory connection that makes such perception possible. The answer is that a universal character such as smokeness or fireness serves as the sensory connection. That is, when one perceives a particular smoke and a particular fire, one has an indirect sensory connection with the universal characters smokeness and fireness that are found in the respective smoke and fire as well. With the help of such universal characters one may then have an extraordinary perception of all smokes and fires. Such extraordinary perception does not show any particular feature of any particular things; it reveals them only as instances of the universals.

[It is understood here that it is reasonable to admit the existence of universals that are nonparticular real entities. For reasons for admitting universals, see my "Nyāya-Vaiśeṣika Theory of Universals," *Journal of Indian Philosophy*, 3, 1975, 363–82. If it is reasonable to admit universals, they might as well put them to use in the present case.]

If, however, universals are taken to provide the sensory connection in the said kind of extraordinary perception, the case for multiple observations may be revived. One may hold that universals cannot be grasped in a single observation. Clearly they are common properties of many things. Multiple observations are needed to know that universals belong to many things.

But this is open to objection. Even if universals provide such extraordinary sensory connection, it does not follow that they have to be known to belong to many things for such sensory connection to be possible. For example, one may know about "lionness" without knowing that lionness belongs to many lions. Multiple observations are not necessary for such awareness of lionness. Accordingly, multiple observations do not appear to be indispensable.

Text. *Na ca kākatalīyatvadiśamkāvyudāsārtham dvitīyādidarśanāpekṣeti vācyam. Dvitīyādidarśane api śamkātādavasthyāt.* (188)

Tran. Objection: The second observation and so on are needed to dispel the apprehension that this is accidental and so on. Reply: No. In spite of the second observation and so on such apprehension remains unchanged.

The objector argues that finding that two things are together in one case is not enough, for such togetherness may be accidental. For example, a crow happens to sit on a branch of a tree and a fruit drops. If one generalizes from one such observation that every time a crow sits on a branch of a tree a fruit drops, that would be too hasty and false. Similarly, one could make a mistake and wrongly identify something as something else in a single observation. One should go through more than one observation to allay the fear of such mistakes or accidental happenings—so says the objector who holds that multiple observation is a necessary condition of generalization.

The reply comes from the standpoint that a mere repetition of observations, however many, does not suffice by itself to remove such fears or doubts. The subsequent observations may also be mistaken or such togetherness may be due to some accident.

Text. *Nanu anaupādhikatvajñānam vyāptijñāne hetuh. Taddeśakālatatrāvasthitag hatādīnām upādhitvaśamkānirāsah kasyacit sādhanavyāpakatvajñānena kasyacit sādhyāvyāpakatvajñānena syāt. Tacca bhūyodarśanam vinā na avatarati iti cet. Na. Ayogyopādhivyatirekasya anumānādhīnajñānatvena anavasthāpātāt.* (188–89)

Tran. Objection: Awareness that no adjuncts are involved is a necessary condition of generalization. The fear that a pot and so on that are found in some particular places or times are adjuncts may sometimes be removed by finding that these pervade the probans or by finding that these do not pervade the proban-

> dum. But this does not take place without multiple observations. Reply: No. Since the elimination of imperceptible adjuncts depends on inferential awareness, that leads to infinite regress.

The protagonist of multiple observations tries once more. Earlier he argued that multiple observations are needed for CR; that was found to be objectionable. Now he takes the position that multiple observations are needed for yet another alleged necessary condition for generalization, viz., determining that things accompanying the assumed pervader/pervaded are not adjuncts the nature of which has been explained earlier. Such determination may be due to finding that the thing concerned does pervade what is assumed to be the pervaded (instead of failing to pervade it); it may also be due to finding that the thing concerned does not pervade what is assumed to be the pervader. For example, take the generalization that all smoky things are fiery. Wet fuel cannot be an adjunct that would falsify it. There is no smoke without wet fuel. So wet fuel pervades what is assumed to be the pervaded. But there is fire without wet fuel. So wet fuel does not pervade what is assumed to be the pervader. Thus wet fuel does not fulfill the conditions of an adjunct and the generalization is saved. It may now appear that determining that something is not an adjunct involves multiple observations. The latter and not merely a single observation is needed to find out that something pervades the so-called pervaded or that something does not pervade the so called pervader.

RS points out that multiple observations may be specially needed for finding that the adjunct does not pervade the probandum. For the adjunct may be observed to be co-located with the probandum in one place, then at least one more observation is necessary to show that the adjunct is absent in some place where the probandum is present [RS in JD 367].

But if the determination that no adjuncts are involved is a necessary condition for generalization, there would be infinite regress. Take an alleged adjunct that is imperceptible. To eliminate it one would have recourse to inference that would be based on some generalization. For the latter, one would need to determine again that no imperceptible adjuncts are involved. Then one would have to have recourse to still another inference and so on to infinity. Thus determination that no adjuncts are involved should not be recognized as a necessary condition for generalization, for that makes the latter impossible.

When Gangesa speaks of awareness of lack of adjuncts (*anaupaāhikatva-jñānam*), should that be interpreted as absence of awareness of adjuncts (*upādhikatva-jñānasya abhāvah*)? No, says JD. The latter condition may be fulfilled on its own. (For example, a lazy person who avoids the hard work of careful and varied observation may be unaware of adjuncts.) But then the objection from the infinite regress arising from the need to eliminate imper-

ceptible adjuncts does not make sense [*Mūle anaupādhikatva-jñānam anaupādhikatvasya niścayah na punaraupādhikatva-jñānasya abāhvah, tathā sati svarūpasata eva tasya hetutvāt ayogyopādhi-vyatireka-jñānasya anavasthāyāgre nirāsāsya unmatta-pralapitatvāpatteh*, JD 367].

Text. *Atha sādhya-sādhana-sahacaritadharmāntarāṇām upādhitvasamśaye na vyāptigrahah atah teṣām anupādhitvajñānam bhūyodarśanādhīna-sādhya-vyāpakatvajñāne satityedartham bhyūyodarśanapekṣā, ata eva yavatā darśanena tanniśayastāvadbhūyodarśanam heturiti na vārasamkhyaniyamo na vā nānugamah. Yadyapi ca anyasya sādhya-vyāpakatva-saādhana-avyāpakatva-samśayo na anya-vyāptigrahapratibandhakah tathāpi tadāhita-vyabhicārasamśayah pratibandhaka iti tadvidhūnanam āvaśyakamiti cet*. (189–91)

Tran. Objection: If there is the doubt that some features accompanying the probandum or the probans are adjuncts, there can be no (reliable) generalization. Determination that these (features) are not adjuncts presupposes awareness of (these features) failing to pervade the probandum; the latter awareness presupposes multiple observations; hence there is need for multiple observations. Hence, as many observations as are needed for determining that (those features are not adjuncts), that many (observations) constitute the necessary condition (of generalization). Accordingly, there is no restriction regarding a specific number (of observations needed for a generalization), nor there is lack of uniformity. Although the doubt that something pervades the probandum and does not pervade the probans does not obstruct the awareness of pervasion involving something else, still the apprehension of deviation arising from that is an obstruction; the removal of that is necessary.

Here is one more attempt to rehabilitate multiple observations. The position above was that determination that no adjuncts are involved is a necessary condition of generalization; this was found to be objectionable. Now the view is that absence of the fear of there being any adjuncts is a necessary condition of generalization. The fear could be due to that some things accompanying the probandum or the probans may be adjuncts; this raises the possibility that the probandum pervades the probans only if such accompanying third factors are available. This apprehension is removed if it is known that the said third factor does not pervade the probandum. But for this determination multiple observations are necessary. If the third factor is found in some cases with the probandum, further observation is needed to learn that they are not together in some other cases. In this connection an objection raised earlier is also refuted. It was objected (by the opponent of multiple observation) earlier that it is unclear exactly how many observations are needed for a generalization. It was also implied that the specific number of observations needed for a generalization may vary from case to case. The defender of multiple observations

now says that no given number has to be given. All that needs to be said is that as many observations as are needed to allay the apprehension is a necessary condition of generalization. When the view is formulated in this way, the charge of failing to find an account that applies to all cases is refuted. Further, it is true that the judgment that there is something that pervades the probandum and does not pervade the probans does not directly by itself obstruct the generalization that all probans-possessing things are also probandum-possessing. Still, the said judgment obstructs the pervasion by implication (*tadāhita*). Hence it is necessary, for the generalization to hold, that the said judgment is false, and for proving the falsity multiple observations are needed.

Text. *Na. Ayogyopādhi-samśayādhīna-vyabhicārasamśayasya tathāpi anucchedāt sa ca na bhūyodarśanāt nāpi anumānāt iti uktam*. (191)

Tran. No. The apprehension of deviation arising from the apprehension that there are imperceptible adjuncts is still not eliminated; the latter is possible neither through multiple observations nor through inference—as already said.

It is argued that the present view is subject to the same objection raised against the immediately above view. What if there are unobservable adjuncts? These cannot be eliminated through observation, multiple or not. But if one seeks to eliminate them through reasoning, there is infinite regress. Hence absence of apprehension of deviation arising from the possible presence of adjuncts cannot be a necessary condition of generalization, for that makes the latter impossible.

MN adds that there may also be situations where there is lack of fear of adjuncts from the very nature of the case; in such a case multiple observations are unnecessary [*Yatra svatah siddha upādhi-śamkā-virahastatra bhūyodarśanasya apekṣā vṛthaiva*, MN 189].

Text. *Api ca bhūyodarśanāhitasamskāro na vahirindriyasahakāri tadvyāpāram vināpi ca sahacārādijñānavato vyāptigrahāt*. (191–93)

Tran. It is also not that the impression from multiple observations is an auxiliary (necessary) condition so far as an external sense organ is concerned. For one who is aware of co-presence and so on may be aware of pervasion without that operation.

Just as multiple observations are not a necessary condition for generalization, so also the impression (*samskāra*) from multiple observations is not a necessary condition for generalization. One may argue that such impression is necessary as an auxiliary causal condition when one becomes aware of pervasion through an external sense organ. In other words, when one sees that

smoke and fire are co-present and co-absent in a number of cases, one may, with the help of the impression from such multiple observation, come to know that all smoke-possessing things are fire-possessing. And it may be said that such pervasion is grasped perceptually through the eyes. For such perceptual grasp of pervasion through an external sense organ the said impression is necessary. Thus, as the source of such impression, multiple observations are also indirectly necessary.

This is rejected. Since the case for multiple observations has failed, the case for impression from multiple observations cannot be made without additional independent reasons. No such additional independent reasons are forthcoming. Under the circumstances, if perceptual grasp of pervasion through an external sense organ is possible without multiple observations, such perceptual grasp is also possible without such impression. Further, pervasion may also be grasped through the inner sense (*manas*). For example, take the generalization that all cognitions that lead to successful activity (*pravṛtti-sāmarthya*) are reliable (*pramā*). When this is grasped by the inner sense, no impressions from external multiple observations serve as a necessary auxiliary condition. So such impression cannot be a necessary condition for all generalizations.

> Text. *Nāpi manasah indriyādivadbhūyodarśanajanyasamskārasya tajjanyasmaraṇasya vā pramāṇāntaratva-āpatteh.* (193)

> Tran. Nor also for the inner sense; for that would invite the objection that like the sense organs, etc., the impression from multiple observation or the remembrance arising from that are additional (unrecognized and rejected) sources of knowing.

It has been shown above that the impression from multiple observations cannot be regarded as a necessary condition for the perceptual grasp of pervasion by an external sense organ. Next one may argue that the impression from multiple observations is a necessary condition for the internal grasp of pervasion. But this too is open to difficulty. There are two possibilities here. First, it may be held that the internal awareness of pervasion arises from the said impression. But then it would turn out to be a case of remembrance. This would go against the view that the awareness of pervasion is direct and not indirect. That is, when one generalizes that all smoky things are fiery, one knows directly that this is so and not indirectly as it would be if it were a remembrance. Second, it may be held that the internal awareness of pervasion arises not from the said impression but from the remembrance produced by the said impression. This is not open to the immediately above difficulty, for an awareness for which a remembrance is a causal condition may still be direct. Nevertheless, it must be noticed, generalization often involves external things such as smoke and fire. The inner sense cannot be credited with the task of grasping directly

such external facts. One may, of course, insist that although the internal grasp of pervasion arises from the said impression, it is still direct. Or one may insist that the inner sense should be entrusted with the job of directly grasping the said external facts with the help of the said kind of remembrance. But these involve innovations regarding epistemic sources that are unrecognized and rejected. The inner sense is inferred (among other things) to account for specific internal phenomena. That does not fit with allowing the inner sense to directly grasp external facts [MN 190].

> Text. *Tasmāt pariśeṣeṇa sakṛddarśanagamyā sā, tathāhi upādhyabhāvo vyāptih abhāvaśca kevalādhikaraṇm tatkālasambandho vāsvaprakāśarūpam tajjñānam vā tacca prathama-darśanena avagatameva cakşurādinā, na ca adhikastadabhāvah asti, na ca pratiyogijñānam adhikaraṇādi-jñānajanakam yena upādhijñaānam vinā tanna syāt, evam upādhyabhāve jñāte kincinna jñātum avaśiṣyate upādhyābhāvavyavahārastu taddhiyam apekşate dirghatvādi-vyavahāra iva avadhijñānam*. (193–94)

> Tran. Therefore, by elimination, that (pervasion) is graspable by single observation. It should be noted that pervasion means absence of adjuncts. But absence is nothing but the bare substratum or the relation with that time or the self-certifying awareness of that. And that is without any doubt grasped by the eye and so on in the first observation. It is not that absence is an additional entity. Nor is it that awareness of the negatum is a necessary causal condition of awareness of the substratum and so on, so that that (awareness of pervasion) could not take place without awareness of the adjunct. If the absence of adjuncts is known in this manner, nothing remains to be known. However, the linguistic usage of absence of adjuncts depends on the awareness of that (the adjunct). This is similar to (the role of) awareness of the boundary with respect to the usage of being long and so on.

The view that multiple observations are a necessary condition of generalization is an old Nyāya view (*jaran-naiyāyika-mata*). This view has been examined in detail and rejected. We now have the view of Prabhakara, the great Mīmāmsā philosopher. In this view, single observation is a necessary and sufficient condition of generalization. Pervasion is the same as absence of adjuncts, for whenever and wherever there is absence of adjuncts there is pervasion and vice versa. But what is absence (*abhāva*)? Is it an additional entity not reducible to any positive entity as the Nyāya holds? No, says Prabhakara. Since there is no compelling reason to regard absence as an additional entity absence is best construed, for reasons of economy, as being reducible to the substratum (*adhikaraṇa, anuyogin*).

Take a common absence, such as absence of the pot on the floor. Here the pot is the negatum (*pratiyogin*) in the sense that what is said to be absent is the

pot. On the other hand, the floor is the substratum or the locus in the sense that this is where the pot is said to be absent. In the Nyāya view, absence is ontologically different from both the negatum and the substratum, both of which are often positive (*bhāva*) entities. Clearly, an absence is not the same as its negatum, for these two are related by way of opposition (*virodha*): if the absence is there, the negatum is not there; if the negatum is there, the absence is not there. Moreover, the Nyāya claims, an absence is not the same as the substratum, for the same absence is found in many places. For example, absence of a pot is found on the floor, on the table and so on. Since the substrates are different, how can the same absence be identical with each?

Prabhakara disagrees. When one says that there is no pot on the floor, all that one needs to admit to exist is the floor. Similarly, when one says that there is no pot on the table, all that one needs to admit to exist is the table. Since there is no compelling reason to admit the existence of an absence as an additional entity, there is also no question of accounting for how such a self-same additional entity can be identical with different substrates. In fact, the truth conditions of the judgment that there is no pot on the floor are the same as those of the judgment that there is the floor. Similarly, the truth conditions of the judgment that there is no pot on the table are the same as those of the judgment that there is the table. It is then superfluous to admit absence as an additional irreducibly different ontological entity.

If, however, absence is nothing but the substratum, what happens when the negatum is there on the substratum? For example, what happens when the pot is on the floor? If absence of the pot is the same as the floor, that absence should still be there. But clearly this is not so, for the pot is there then. To meet this difficulty Prabhakara suggests that absence should not be identified with simply the substratum but more restrictedly with the substratum only at the time the negatum is absent. Alternatively, absence could be identified with the time the negatum is absent. Similarly, absence could be reduced to awareness of the substratum at the time when the negatum is absent. Alternatively, absence could be reduced to awareness of the time when the negatum is absent. This makes absence something different from the substratum and also avoids the admission of additional negative entities. Since, however, absence is now viewed as different from the substratum, it can now be explained without any insuperable difficulty how absence can be said to be located (*ādheya*) on the substratum (*ādhāra*) [*Ādhārādheyabhāvānupapatteh āha tatkāleti*, RD 177].

It may be held further that awareness of the substratum at the time when the negatum is absent is self-certifying (*svaprakāśa*). RD observes that here being self-certifying implies being visible [*Sva-prakāśa-rūpam ityanena cākṣuṣatvam upapāditam*, RD 178]. It is implied that perception is clearer and more specific than other kinds of cognition and that visual perception is

clearer and more specific than other kinds of perception. Thus at least visual perception may be credited with grasping pervasion in the first encounter. Time is externally perceived in the Prabhakara view (though not in the Nyāya view). So absence remains visible and perceptible in the Prabhakara view even if absence is construed as the time when the negatum is absent. At any rate, Prabhakara holds that in general truth is intrinsic and self-certifying. Now absence of the adjunct should then be construed as the self-certifying awareness of the probans that is the substratum of absence of the adjunct. If such awareness is self-certifying and if pervasion is the same as such awareness, pervasion may very well be grasped in the first observation of the probans.

If absence is reduced to the substratum or the said time or awareness, it is no longer necessary to hold that awareness of absence presupposes awareness of the negatum as the Nyāya holds. If pervasion is the same as absence of the adjunct and if awareness of such absence presupposes awareness of the adjunct that serves as the negatum, it may be difficult to maintain that pervasion is graspable in the first observation. For determination of adjuncts may very well be claimed to involve multiple observation. But this is avoided when absence is reduced to the substratum or the said time or awareness, for awareness of the substratum does not presuppose awareness of the negatum. Awareness of pervasion is then possible through awareness of the probans without prior awareness of the adjunct. This lends credence to the thesis that pervasion is graspable in the first observation of the probans.

One may say that if absence is reduced to awareness of the substratum at the time the negatum is missing and if pervasion is the same as absence of the adjunct in the probans, pervasion may not be grasped in the first observation of the probans but may only be grasped when adjuncts are missing. But this objection is due to an oversight. While adjuncts may be found in a pseudo-probans (*hetvābhāsa*), a probans (*saddhetu*) is always devoid of adjuncts.

Although absence is reducible to the substratum and awareness of the substratum amounts to awareness of absence, such linguistic usage as that there is no pot on the floor still presupposes awareness of the negatum, Prabhakara holds. That is, additional conditions need to be fulfilled when some awareness is expressed in language. It is not surprising that the same holds in the present case. Clearly, the negatum is included within the body of such linguistic statement of absence. Hence no such statement is possible without awareness of the negatum. But it does not follow that absence cannot be known without prior awareness of the negatum. This is similar to the situation of such judgments as that something is long. The length of a substance may be grasped under the same conditions as those of grasping the substance itself. Hence awareness of length does not presuppose awareness of the length of something else. Still, to judge that something is longer than something else, the awareness

of the length of something else that serves as the standard (*avadhi*) of comparison is required. [This example is given from the standpoint of Prabhakara and not from that of Nyāya.] Thus while awareness of something in a certain way may not require awareness of something else, awareness of the same thing in a different way may require awareness of something else.

Text. *Na ca evam raāsabha-sambandha-tulya-vahni-dhūma-sambandha-jñānāt eva anumitih syāt iti vācyam. Upaādhi-smaraṇe sati upādhi-tadvyāpyetara-sakala-tadupalambhaka-samavadhaāne ca upādhyanupalambha-sāhitasya kevalādhikaraṇa-jñānasya anumitihetutvāt tadvyavahara-hetutvācca.* (194–95)

Tran. Objection: If this is so, let there be (reliable) inference from awareness of the relation between fire and smoke that is similar to the relation with a donkey. Reply: No. The necessary conditions of a (reliable) inference and those of the linguistic expression of a (reliable) inference include simple awareness of the substratum and nonperception of the adjunct under the circumstances when there is remembrance of the adjunct and all factors needed for perception of the adjunct and what is pervaded by it are otherwise available.

Prabhakara holds that awareness of pervasion that is the same as awareness of absence of adjuncts may take place from the first observation of the probans itself. If so, how can unreliable inferences be separated from reliable ones, such as when one (wrongly) infers smoke from fire or (wrongly) infers fire from the observation of a donkey?

The reply is as follows. Simple awareness of the probans is not the only necessary condition of a reliable inference. Another required condition is that there is nonapprehension of the adjunct under the circumstances when it should have been apprehended if it were present and there is remembrance of the adjunct. Clearly, the second condition is not fulfilled when one wrongly infers smoke from fire. The adjunct here is wet fuel. Since it is present in the location of fire, it should be apprehended rather than not apprehended.

It may be noted that in the text "what is pervaded by the adjunct" refers to such things as sensory connection with the adjunct.

RS interprets the above view as that the causal condition of linguistic usage is itself a causal condition of inference. That is, awareness of the probans in so far as it is devoid of adjuncts is a causal condition of inference. In such awareness being devoid of adjuncts should be featured as a qualifier [*Tadvyavahārasya hetureva anumitihetuh tacca upadhyābhāvatvena jñānam*, RS in JD 370–71]. JD too confirms this interpretation of RS [*Ithamca vyavahāra-hetureva heturyasya iti . . . anumiteh vyavahāra-hetu-hetukatvādityarthah*, JD 370].

Some think that the view of Prabhakara should be explained as that (not only perception (or awareness) of the probans but) perception (or awareness) of the probans as co-located with the probandum in so far as the probans is perceived

(or cognized) to be devoid of adjuncts when all other conditions of perception (or awareness) of the adjunct are available is a causal condition of inference.

Some others interpret the Prabhakara view as that nonapprehension of the adjunct when there is remembrance of the adjunct is a causal condition of inference [*Kecittu . . . upādhi-smaraṇe sati upādhyanupalambhādanumitih*, JD 370]. That is, they think that it is superfluous to add that all other conditions needed for perception of the adjunct and what is pervaded by it should be available. But this is open to the objection that although there is remembrance of the adjunct, it may not be perceived due to inattention and so on; if this suffices as a causal condition of inference, the issue of separating reliable from unreliable inferences would have to be resolved all over again.

It has already been said that absence in the view of Prabhakara is reducible to the substratum. So RS explains absence as a particular nature (*svarūpa-viśeṣa*) that is evidenced by such a cognitive state as that this is not here [*Abhāvatvañca idamiha nāstiti pratītisākṣikah svarūpa-viśeṣah*, RS in JD 371]. It is implied that absence relates to that part of such awareness that is other than the negatum so that it is reducible to the substratum. Since absence may also be explained from the viewpoint of Prabhakara as awareness of the substratum, RS adds, as an alternative view, that absence may also be something additional. GD comments that the second view is suggested because in the light of the first view it is difficult to explain how the same absence may be in different places [*Svarūpa-viśeṣatve anugata-pratītyupapādakatvayoga ityāśayenāha padārthāntaram veti*, GD 652]. However, if absence is merely identified with awareness of the substratum, since such awareness will be different as the substrates become different, it still remains difficult to explain how the same absence may be in different places.

Text. *Nanu evam prathamadarśanena vyāptiniścayāt viśeṣadarśane sati rāsabhādisamśayavat tatsamśayo na syāt iti cet, vyāptijñānānantaram kim vidyamana eva upādhirmayā upadhitvena na jñāta iti śamkayā grhītavyāptāvapi samśayah atastatra bhūyodarśanena upādhiniraāsadvārā vyāptyabhāvaśamkā apanīyate.* (195–96)

Tran. Objection: Since pervasion is in this way known from the first observation, there should be no doubt about it like the doubt about a donkey when there is discernment of a specific factor. Reply: After awareness of pervasion there may be doubt about that pervasion due to a doubt of such a form as: “Is it that although an adjunct is present I have not recognized it as an adjunct?” Hence in that case the adjunct is eliminated by way of multiple observations and thus the doubt regarding the lack of pervasion is removed.

If pervasion were grasped through the very first observation of the probans, how can there be such doubt as whether smoke is pervaded by fire or not?

That is, when one sees smoke for the first time, one also knows that smoke is pervaded by fire. This would rule out doubt over such pervasion, for a belief about some fact is opposed to the doubt about the same fact. For example, when one knows that there is something having a specific feature that only a donkey has, one knows that the thing in front is a donkey and no longer has the doubt over if that thing is a donkey or not. Similarly, since there is constant absence of adjuncts in a probans, pervasion must be grasped from the first observation of the probans. This specific belief in pervasion would rule out any doubt about it. But this is clearly not so. We do have doubts over pervasions. So how can Prabhakara be right?

In reply the following solution is offered on Prabhakara's behalf. After learning about a pervasion it is still possible to wonder that an adjunct may be involved and that maybe it has not yet been detected. Then one should have recourse to multiple observations to show that such doubt is not justified. That is, when a pervasion is known, it may not invariably be known that it is devoid of all adjuncts. For the latter determination multiple observations are useful. Thus multiple observations are acknowledged to have a subsidiary role in generalization although it is not recognized to have a primary role.

In other words, since in the view of Prabhakara pervasion is nothing other than absence of adjuncts, and since absence is not anything other than the locus of absence, it is possible to learn about pervasion from the first observation of the probans that is pervaded by the probandum. For example, it is possible to learn from the first observation of smoke that it is pervaded by fire. This is possible because the pervasion of smoke by fire is nothing other than the absence of adjuncts in smoke and the absence of adjuncts in smoke is ontologically nothing other than smoke itself. Thus being pervaded by fire or being concomitant with fire without the involvement of any adjuncts is a property of smoke. The first observation of smoke is the primary source of knowledge of this feature of smoke. Still, after the first observation of smoke it is possible to have the doubt that some unobserved adjunct may be there. This may be explained with the following example. As one observes Padmapada approaching one may also think that a disciple of Samkara is approaching, for Padmapada is a disciple of Samkara. Still, even if this observation of Padmapada is the primary source of one's awareness that a disciple of Samkara is approaching, it is possible, after the first observation of Padmapada, to have the doubt if a disciple of Samkara is approaching. The doubt may then be resolved with supplementary information that may be gathered. In a similar way, after the first observation of smoke one may have the doubt that some unnoticed adjunct may be present in smoke although absence of such adjuncts is a property of smoke and the first observation of smoke is the primary

source of awareness of that property. The doubt may then be resolved with supplementary information gathered from further observation.

RD observes that the above reply is from the standpoint that only a belief having the same qualifier is an obstruction to a doubt with that qualifier [*Samāna-prakāraka-niścayasyaiva samśaya-virodhitvāt*, RD 180]. The doubt is about the presence or absence of adjuncts. Thus we have a doubt in which absence of adjuncts is a qualifier. This is obstructed only by a belief with absence of adjuncts as the qualifier (i.e., only by a belief that there are no adjuncts). Prabhakara claims that although pervasion is grasped in the first observation, absence of adjuncts need not be the qualifier in that belief. Indeed, some Nyāya philosophers hold that pervasion is reducible to smokeness and so on. Accordingly, smokeness and so on may be the qualifier in such a belief. So the belief would not obstruct the doubt and thus the doubt about if adjuncts are present or not remains possible.

Text. *Yadvā jñānaprāmāṇyasamśayāt vyāptisamśayah yathā ghata-jñāna-sāmagryām satyām ghatajñāne sati tatprāmāṇya-samśayāhitatatsamśayo na tu agrimasamśayānurodhena tatra ghatajñānam eva na vṛttam iti kalpyate tathā iha api upādhyābhāvasya vyāptitvāt tasya ca kevalādhikaraṇarūpasya prathamadarśane api niścitatvāt vyāptigrāhakāntarasya abhāvāt ca pariśeṣeṇa sakṛddarśanasya vyāptigrāhakatvāt tanniścaye prāmāṇyasamśayāt eva tatsamśayah.* (196–98)

Tran. Or the doubt about pervasion is due to doubt about reliability of awareness. This is like the fact that if there are causal conditions of awareness of a pot and accordingly there is awareness of a pot there may still be doubt as to whether that (awareness of a pot) is reliable due to doubt as to whether that (any awareness) is reliable. We do not suppose there that the subsequent doubt rules out awareness of a pot itself. Similarly, in this case also the following is suggested. Pervasion is nothing other than absence of adjuncts and that (absence) is nothing other than the locus alone. Accordingly, pervasion is grasped from the first observation (of the probans). There is also no other (legitimate) method of generalization. Thus, since by elimination single observation turns out to be the (only proper) method of generalization, after the grasp of that (pervasion) the doubt about that is (i.e., may be explained to be) due to doubt about awareness (in general).

Another solution is offered on behalf of Prabhakara who holds that pervasion is grasped from the first observation of the probans and accordingly faces the task of explaining how there can still be the doubt as to whether the probans is pervaded by the probandum.

Such doubt, it is pointed out, need not be due to anything specific about the pervasion concerned but may be due to skeptical doubt about whether any awareness is reliable. After one has perceived a pot one may doubt the reliability of that perception on the general ground that perception is a kind of

awareness and that any awareness is open to doubt. In the same way, one may entertain doubt about some pervasion after it is grasped from the first observation of the probans on the general ground that this is a kind of awareness and that any awareness is open to doubt. The plausibility for this solution is derived, of course, from several views for which arguments have already been presented, viz., that pervasion is nothing other than absence of adjuncts, that absence is nothing other than the locus alone and that single observation is the most acceptable method of generalization.

Since two solutions have been offered, one may enquire about the need for the second solution. The following is a reason why one may prefer the second solution to the first given above. The point of the first solution may be freely interpreted as follows. Although pervasion is nothing other than absence of adjuncts, one may be aware of pervasion in such a way that being devoid of adjuncts (*upādhyābhāvatva*) is not the qualifier (*prakāra*) of that awareness. That is, although pervasionness (*vyāptitva*) and being devoid of adjuncts are coextensional, it is possible to have an awareness of pervasion in which pervasionness is the qualifier but not being devoid of adjuncts. Hence one may be aware of pervasion from the first observation and still not be aware of absence of adjuncts. Then doubt over whether the relation between the probans and the probandum is dependent on some adjunct remains possible. This is similar to the two properties of being bound by three straight lines and having angles that are equal to two right angles. These two properties are coextensional, for all triangles are bound by three straight lines and also have angles that are equal to two right angles. Still, one may be aware of a triangle as being bound by three straight lines and not be aware that its angles are equal to two right angles. Some, however, may disagree. They may argue that although the above scenario may hold with regard to some other properties, it does not hold with regard to pervasionness and being devoid of adjuncts, for the only sense of pervasionness is being devoid of adjuncts. Or they may argue that even if in the said awareness pervasionness is the qualifier and being devoid of adjuncts is not the qualifier, still that awareness could suffice to block the relevant doubt as to whether the probans is pervaded by the probandum, for one may hold that a belief may block a doubt even if the relevant qualifiers are not exactly the same. Such thinkers would, therefore, look for a different solution; hence the need for the second solution; the latter is not committed to the above views presupposed in the first solution. RD adds that the second solution is offered to show how doubt as experienced is possible even if one holds that truth is intrinsic and self-certifying as Prabhakara does [*Svatahprāmānya-vādināpi anubhūyamānasya prāmāṇya-samśayasya kathañcidupapādanīyatvat*, RD 180–81].

RS comments as follows. The objection from lack of doubt about the nature of pervasion may be answered in two different ways. First, is the doubt over a pervasion where the relation between the probans and the probandum is of the nature of being devoid of adjuncts? Then the objection is accepted. That is, in such a case the doubt is ruled out (unless there is a stimulant) [*Vyāpti-svarūpe saṃśayābhāva āpadyate nirupādhi-sambandha-rūpa-vyāptitvena vā, ādye iṣṭāpattiḥ*, RS in JD 371]. GD adds that being an adjunct-free relation (*nirupādhi-sambandha-svarūpa*) means co-location with the probandum in so far as that is specified by absence of adjuncts and so on (*upādhi-abhāvatvādyavacchinna-viśiṣṭa-sādhya-sāmānādhikaraṇya-svarūpa*, GD 653). If the first observation produces a belief in which absence of adjuncts is featured as a qualifier, there is no room (unless there is a stimulant) for the doubt over if any adjuncts are involved or not.

Second, is the doubt over a pervasion where the relation between the probans and the probandum is observed when there is no remembrance of the adjunct and so on or when there is such remembrance and so on? If the first, there is only lack of awareness of the adjunct but no awareness in which absence of adjuncts is featured as a qualifier. Since belief about pervasion is a belief about being devoid of adjuncts, it is a belief in which absence of adjuncts is featured as a qualifier that is opposed to the doubt about pervasion and not merely lack of awareness of adjuncts. So in such a case the doubt is not ruled out and the objection is rejected. If the second, the objection is rejected by having recourse to the doubt if any awareness is reliable [RS in JD 371–73]. That is, introducing the doubt from reliability of awareness is useful, for in this case there is a belief in which absence of adjuncts is featured as a qualifier and so the doubt about if adjuncts are involved or not is not ordinarily possible [GD 655]. Thus, even if there is a belief in something, it is possible to have a doubt about that by having a doubt about something of which that is a species. This is reminiscent of the genus-linked (*sāmānyatodṛṣṭa*) reasoning recognized in the *Nyāyasūtra* (NS 1.1.5 and Vatsyayana's *Bhāṣya*).

Text. *Na ca evam rāsabhe api prathamam vyāptiparicchedaḥ syāt iti vācyam. Tatra vyāpterabhāvāt, pratyakṣajñāne viṣayasya hetutvāt, kvacit asaṃsargāgrahāt tathā vyavahāro doṣamāhātmyāt. Na ca atra api tathā, āropе sati nimittānusaraṇam na tu nimittam asti iti āropaḥ iti abhyupagamāt.* (198–99)

Tran. This does not involve that at first (i.e., when smoke is first observed) even a donkey (that happens to be present where smoke is first observed) would be taken to be pervaded (by fire). For there is no pervasion there (i.e., it is not true that wherever there is a donkey there is fire) and the object is a causal condition in perceptual awareness; however, sometimes because of a defect one fails to notice the lack of connection (between a perceived item and a remembered item)

and this leads to linguistic usage of that sort. It is not that this is so here too. What is admitted is that one looks for a causal condition (of error) if there is an error but not that if there is a causal condition (of error) there is an error.

Suppose that one gets to learn that smoke is pervaded by fire when one first observes smoke together with fire. Now suppose that something coincidental such as a donkey is also there together with fire. Just as one gets to learn from a single observation that wherever there is smoke there is fire, why should not one also learn (falsely) that wherever there is a donkey there is fire (or that wherever there is a donkey there is smoke)?

The reply on behalf of Prabhakara begins with the claim that awareness of pervasion is perceptual. As the probans is perceived, it may also be perceived as pervaded by the probandum. For example, when smoke is first perceived, it may also be perceived as pervaded by fire. Being pervaded by fire is a property of smoke and hence it is possible for smoke to be so perceived. But even if a donkey happens to be there, it would not be perceived as pervaded by fire. Being pervaded by fire is not a property of that (or any) donkey. Hence it could not be so perceived, for the perceived object serves as a causal condition of perception, Prabhakara claims, and where the perceived object is nonexistent there is no perception of that object either. Some Nyāya philosophers distinguish between ordinary perception and extraordinary perception. They hold that although the perceived object is a causal condition for ordinary perception, it is not so for extraordinary perception. But Prabhakara rejects extraordinary perception. So for Prabhakara the perceived object is a causal condition for all perceptions [for Prabhakara's explanation of perceptual error, see my "The Truth About Perceptual Error," in *Essays in Indian Philosophy*, Allied Publishers, Kolkata, 1997, 297–311].

Text. *Kecit tu sādhanavanniṣṭhātyantābhāvāpratiyogi-sādhya-sāmānādhikaraṇyam sādhanavanniṣṭhānyonyābhāvāpratiyogisādhyavatkatvam vā vyāptih tadubhayam api yogyam pratyakṣeṇa vahni-dhūma-sambandha-anubhavena prathamam avagatam eva. Mahānase yah atyantābhāvah anyonyābhāvo vā avagatah tasya pratiyogi na vahnih na vaā vahnimān iti anubhavāt. Rāsabhe tathā avagame api agre sah bādhyate iti.* (200–201)

Tran. Some are of the following view. Pervasion is co-location (of the probans) with the probandum that is not the negatum of the absolute absence that is present where the probans is. Or pervasion is having a probandum that is not the negatum of the difference from what has the probans. Both are perceptible and are grasped in the first (observation) itself through perception (*anubhava*) of the relation (i.e., co-location) of fire and smoke. For it is known that fire is not the negatum of the absolute absence present in the kitchen (where smoke or the familiar probans is) nor is what is possessed of fire the negatum of the difference

> there. Although a donkey (that is by chance present where smoke or the probans is) may also be so known (i.e., known to be pervaded by fire), that is falsified later.

Previously pervasion has been explained as absence of adjuncts (as Prabhakara holds) and it has been argued that if pervasion is understood in this way it can be grasped in the first observation of the probans. Now a different explanation of pervasion that appears to be closer to the Nyāya view is offered and it is argued that even if pervasion is understood in the latter way it can be grasped in the first observation of the probans. It may be noted that neither the mainstream Nyāya nor Prabhakara accept this viewpoint: it is still a possible view that is worth exploring.

First, pervasion is explained by utilizing the idea of absolute absence. If fire is to pervade smoke, the former should not be absent where the latter is. This is expressed by saying that fire is not the negatum of the absolute absence found in a location where the probans smoke is, such as a kitchen. In a kitchen one may find all kinds of absolute absence, such as that of gold, water and so on; but one does not find the absolute absence of fire, for there is fire in a kitchen when smoke is there.

Then pervasion is explained by utilizing the idea of difference. If fire is to pervade smoke, what is smoke-possessing should also be fire-possessing; that is, what is smoke-possessing should not be different from what is fire-possessing. In other words, what is fire-possessing should not be the negatum of the difference from what is smoke-possessing. This is corroborated in a kitchen. In a kitchen one may find all kinds of difference, such as difference from what is gold-possessing or water-possessing and so on, but one does not find the difference from what is fire-possessing, for the kitchen is fire-possessing. If pervasion is understood as above, it may be observed, Prabhakara claims, when smoke and fire are first observed in the kitchen.

This account of pervasion does not overextend to such cases as co-location of a donkey with smoke in a given kitchen. Since the donkey happens to be in that locus of smoke, the former is not the negatum of any absolute absence in that locus of smoke. Similarly, in that case what is smoke-possessing is also donkey-possessing; that is, what is donkey-possessing is not the negatum of the difference that is found in that particular locus of smoke. Still there are other places where there is smoke but no donkey. Thus the donkey is the negatum of an absolute absence found in some other locus of smoke, such as a different kitchen. Again, since that other locus of smoke is not donkey-possessing, it is different from what is donkey-possessing; that is, what is donkey-possessing is the negatum of a difference that is found in that locus of smoke.

Text. *Tat na. Evam tattadvahnitattaddhūmayoh eva vyāptih syāt na tu dhūmatvavahnitvāvacchedena. No ca tat anumānopayogi, vahnitvam vahnimatvam vā na pratiyogitāvaccedakam iti prathamato jñātum aśakyam eva.* (201–2)

Tran. Not so. If so, there should be pervasion between this particular smoke and this particular fire and that particular smoke and that particular fire but not in so far as it is specified by smokeness and fireness. And that is not useful for inference. Further, that fire or being possessed of fire is not the specifier of absenceness cannot possibly be known at first.

The above view of some followers of Prabhakara is now criticized. The above account applies to the pervasion between this particular smoke and this particular fire or that particular smoke and that particular fire and so on. Such pervasions are called *viśeṣavyāpti* or particularized pervasions. These are acceptable as cases of pervasion. For it remains true from the viewpoint of Nyāya ontology that neither this particular smoke nor this particular fire exists anywhere else. So it follows that this particular smoke does not exist without this particular fire. Accordingly, this particular fire is not the negatum of any absolute absence that is found where this particular smoke is. Similarly, what is possessed of this particular fire is not the negatum of the difference that is found where this particular smoke is, for the location of this particular smoke is known to have this particular fire. Such a pervasion may be expressed in the form of a general proposition as: whatever is possessed of this particular smoke is possessed of this particular fire. Given that this particular smoke and this particular fire are not found anywhere else and given that both are found in the particular location under consideration, this pervasion is true. Indeed, the same general proposition may be expressed as a conditional: if anything is possessed of this particular smoke, it is possessed of this particular fire. *Ex hypothesi*, there is no situation in which the antecedent of this conditional is true and the consequent is false so that this conditional or the said pervasion is false.

Still the above account of pervasion (favored by some but not most followers of Prabhakara) is too narrow, for it fails to apply to such cases of pervasion as that wherever there is smoke there is fire or that what is specified by smokeness (i.e., all smokes) is pervaded by what is specified by fireness. In this latter case the specifier of pervadedness is smokeness and the specifier of pervaderness is fireness. But in the particularized pervasion above the specifier of pervadedness is this-smokeness and the specifier of pervaderness is this-fireness. Although the particularized version of pervasion may be known from a single observation, it does not follow that the generalized version of pervasion is also known from a single observation. Indeed, the latter is not knowable from a single observation. All that is known is that this particular

fire is not the negatum of any absolute absence found in a place where this particular smoke is. Since other fires are absent where this particular smoke is, they are negata of absolute absences found there; therefore, fireness is not the specifier of such negatumness. This-fireness too is not the specifier of the negatumness of all absences co-located with all smokes [*Na dhūma-sāmānya-samānādhikaraṇa-tādṛṣābhava-pratiyogitā-sāmānyāvacchedakam*, RS in JD 374–75]. Further, there is sensory connection with this kitchen but not with distant kitchens. So absolute absences belonging to other kitchens are not perceivable and it cannot be known from the first observation that fire is not the negatum of absolute absences belonging to other kitchens [JD 374].

> Text. *Mā evam. Prakṛta-sādhya-vyāpaka-sādhanāvyāpako vū sādhanatvābhimatena samam prakṛta-sādhya-sambandhitāvacchedakam viśeṣaṇam va upādhih. Ubhayathā api tadabhāvo na vyāptih. Siddhyasiddhibhyām tanniṣedhānupapatteh.* (202–3)

> Tran. Not so. An adjunct is that which pervades the actual probandum and does not pervade the probans. Or an adjunct is that qualifier which serves as the specifier of the relationship of what is taken to be the probans with the actual probandum. But pervasion is not the absence (or negation) of that in either interpretation. For the negation (or absence) of that (in a probans) neither by way of presence nor absence is acceptable.

After rejecting the view of a smaller section of the followers of Prabhakara, the mainstream view of Prabhakara is now brought under criticism. First, an adjunct is explained from the Nyāya viewpoint as that which pervades the putative probandum and does not pervade the putative probans. For example, if one infers smoke from fire, fire is the putative probans and smoke is the putative probandum and the inference is based on the false generalization that wherever there is fire there is smoke. The adjunct here is wet fuel that does pervade the putative probandum smoke but not the putative probans fire.

Next, an adjunct is explained from the Mīmāmsā point of view: an adjunct is a corrective or delimiting factor that binds the intended probans with the intended probandum; without this corrective or delimiting factor the intended probans strays from the intended probandum and this is why the generalization becomes false. Again, the above example of inferring smoke from fire makes this clear. As long as the fire is produced by wet fuel, it also produces smoke. That is, in this example, as long as the intended probans is associated with the adjunct, it does not stray from the intended probandum. Thus it is false to say that all fires produce smoke. But it is true to say that all fires with wet fuel produce smoke. Thus, when the intended probans is further specified and narrowed down with reference to the adjunct, the modified

generalization is true. In the above example, inference of smoke from fire is false but inference of smoke from fire produced by wet fuel is not false; the intended probans thus should not be fire but fire produced by wet fuel.

To press for the view that pervasion is known from the first observation of the probans Prabhakara has argued that pervasion is nothing other than absence of adjuncts. But although a probans (proper) is devoid of adjuncts, caution should be taken in clarifying the precise sense of absence of adjuncts, Gangesa points out. Suppose that the intended probans is associated with an adjunct and depends on the latter for co-location with the intended probandum. Then the adjunct does exist but there is no absence of the adjunct in the putative probans which as a matter of fact is associated with the adjunct whenever that probans is co-located with the intended probandum. Now, suppose that the intended probans is a proper probans (*saddhetu*), is not associated with an adjunct and does not depend on the latter for co-location with the intended probandum. Then the adjunct does not exist and so its absence, in so far as it is the absence of something unsubstantiated (*aprasiddha*), is uncorroborated and unacceptable.

Being devoid of adjuncts can be explained differently in a way that avoids the above difficulty as the following text shows.

> Text. *Kintu yāvatsvavyabhicārivyabhicārisādhyasāmānādhikaraṇyam anaupādhikatvam tasya prathamam jñātum aśakyatvāt.*

> Tran. But being devoid of adjuncts is (explicable as the probans) being co-located with a probandum that deviates from all that does not pervade itself (the probans): this cannot be known at first.

Being devoid of adjuncts is now construed as co-location of the probans with a probandum that deviates from everything that fails to pervade the probans. Take the (reliable) inference of fire from smoke. Here the probans smoke is devoid of adjuncts (i.e., does not depend on an adjunct for co-location with fire, the probandum). For example, water does not pervade smoke and fire deviates from water; hills do not pervade smoke and fire deviates from hills and so on. Next, take the faulty inference of smoke from fire. Here the putative probans fire is not devoid of adjuncts and does depend on the adjunct wet fuel for co-location with smoke, the probandum. But the probandum does not deviate from everything that fails to pervade the putative probans fire: the adjunct wet fuel does not pervade fire (i.e., fire is found without wet fuel). But smoke, the probandum, does not deviate from wet fuel, for wherever there is smoke, there is wet fuel.

But when being devoid of adjuncts is understood in this way, it is clear that it cannot be known from the first observation: it cannot, for example, be de-

termined from the first time smoke is found with fire that the latter does stray from other things (such as water, hills and so on) that fail to pervade smoke. The latter determination requires further investigation.

> Text. *Kim ca na vastugatyā vyāpteh jñānam hetuh kintu vyāptitvena tat ca upādhyābhāvatvam. Na ca upādheh ajūāne tadabhāvatvena jñānam sambhavati, viśeṣaṇajñānasādhyatvāt viśiṣṭajñānasya. Na ca niyamatah prathamam upādhidhīh asti.* (203–4)

> Tran. Again, awareness of pervasion that is a fact is not a causal condition; rather (awareness of pervasion is a causal condition of inference) in so far as it is qualified by pervasionness, and that is absence of adjuncts (in Prabhakara's view). Unless one is aware of adjuncts one cannot be aware of their absence, for awareness of something qualified presupposes awareness of the qualifier. And it is not that adjuncts are invariably detected in the very beginning.

One more objection to the view of Prabhakara is that pervasion is grasped in the first observation of the probans together with the probandum. For the sake of argument one may provisionally grant to Prabhakara that absence of adjuncts is ontologically reducible to the probans as the locus of that absence. But it does not follow that awareness of the probans by itself suffices for a causal condition of inference. What is needed for the latter is awareness of the probans in so far as it is pervaded by the probandum. For example, for inference of fire from smoke awareness of smoke by itself is not enough; it must further be supplemented with awareness that smoke is pervaded by fire. Even if it is granted that the fact that smoke is pervaded by fire is ontologically nothing other than smoke itself, it does not follow that awareness of smoke itself amounts to awareness of smoke as pervaded by fire. Now Prabhakara holds that being pervaded is nothing but being devoid of adjuncts. So if one is to grasp that smoke is pervaded by fire, one must grasp that co-location of smoke with fire is not dependent on any adjuncts. This is clearly more than being aware of smoke itself and there is no evidence that awareness of smoke by itself suffices for awareness of smoke as pervaded by fire or as being co-located with fire without the intervention of any adjuncts.

Further, the first observation of smoke does not by itself amount to awareness of smoke as being co-located with fire without dependence of any adjuncts. The latter is a more complex judgment that includes as a component (in its qualifier part) that no adjuncts are involved. That is, it is more complex than the judgment that there is smoke. Absence of adjuncts is contained in the more complex judgment but not in the less complex judgment that there is smoke. The more complex judgment is possible only if the component in the qualifier part is already known. (In the view of many Nyāya philosophers, al-

though not in Prabhakara's view, judging that something is qualified by something presupposes awareness of the qualifier.) That is, the more complex judgment is possible only if it is already known that no adjuncts are involved. Since awareness of the probans alone does not amount to awareness of lack of adjuncts, the requisite conditions for the more complex judgment are not fulfilled and cannot be yielded by the first observation of the probans.

Again, awareness of absence of adjuncts is itself awareness of something complex and is possible only if there is already awareness of adjuncts. Clearly one who has no awareness of a pot cannot be aware that there is absence of a pot. It follows thus that if one is to have the awareness that the probans is not dependent on any adjunct, one must already have the thought of the adjunct. But as one observes the probans one does not necessarily have the thought of the adjunct and, accordingly, one does not necessarily get to know that the probans is not dependent on any adjunct.

Moreover, when an adjunct is involved, co-location of the probans with the probandum depends on the adjunct. Accordingly, the relationship of the probans with the probandum is not specified by the fact of being the probans alone but by something more. On the other hand, if no adjunct is involved, the said relationship is specified by the fact of being the probans alone. That the probans is co-located with the probandum can certainly be known from the first observation. But that the said relationship is not specified by anything more than the fact of being the probans alone is not known from the first observation. But the latter is needed for reliability of probans-based inference and the first observation alone does not provide for that [RS in JD 374].

Prabhakara would disagree that awareness of the qualified presupposes awareness of the qualifier. But even if one holds that not awareness of the qualifier but the causal conditions of the latter awareness are needed for awareness of the qualified, the objection would still remain; for the said causal conditions are not provided by the first observation alone [RS in JD 375–76].

Finally, some adjuncts are imperceptible. That no adjuncts are involved cannot be known from observation in any case. One should not say that elimination of perceptible adjuncts alone is all that is relevant in such an inference. For then such inferences could be reliable even if imperceptible adjuncts are detected [RS in JD 376–77].

Text. *Yat ca uktam pratiyogijñānam vyavahārahetuh na abhāvajñāne iti, astu tāvat evam tathā api tadabhāvo mā vyavahāri upādhyābhāva-jñānadhīnānumitih syāt eva upādhijñānam vinā api, na ca evam.* (204–5)

Tran. It has been said (by Prabhakara) that awareness of the negatum is a causal condition of speech (about absence) but not of awareness of absence. Let this be so. Then there should be no speech about absence of that (= adjuncts); neverthe-

less there should be inference that requires awareness of absence of adjuncts although there is no awareness of adjuncts. But this is not so.

Prabhakara disagrees with the Nyāya and holds that an awareness of absence may take place without awareness of the negatum. Then awareness of absence of adjuncts may take place without awareness of adjuncts. Only the speech about absence cannot take place without awareness of the negatum.

For the sake of the argument Gangesa grants this to Prabhakara. Then the speech about the absence of adjuncts could not take place without awareness of adjuncts. Still awareness of absence of adjuncts could possibly take place without awareness of adjuncts. Now inference presupposes the awareness of pervasion and the latter, in the view of Prabhakara, is nothing but absence of adjuncts. Thus it follows, granting the viewpoint of Prabhakara, that inference that presupposes awareness of absence of adjuncts could take place without awareness of adjuncts. But this is not acceptable, for this raises questions about reliability of inference as a source of knowing. For awareness of absence of adjuncts to be a reliable condition of inferring adjuncts should be eliminated and the latter is not possible without awareness of adjuncts.

Text. *Vastutastu viśeṣadarśane sahacārādisādhāraṇadharmadarśanāt vyabhicārasamśayāt prathamadarśane na vyāptiniścayah*. (205–6)

Tran. As a matter of fact when there is lack of observation of any specific feature (that favors one and rules out the other alternative), there is (possibility of) fear of deviation from observation of common features (i.e., features that are compatible with both alternatives) such as co-presence, and hence there can be no determination of pervasion from the first observation.

Gangesa reinforces his objection that awareness of absence of adjuncts cannot be a reliable condition of inferring if it is gathered from the first observation alone merely showing that the probans and the probandum are co-present. A deviant mark is also observed to be co-present with the probandum in some places. So co-presence is a common (*sādhāraṇa*) feature—that is, it is true of both a nondeviant probans and a deviant mark. Awareness of such a common feature raises the fear of possible deviation. This fear is not allayed unless there is also awareness of a specific (*viśeṣa*) feature that fits with only one of the alternatives presented in doubt. For example, if one is faced with uncertainty about whether a thing in front is a man or a statue, a limb movement will be a specific feature that would resolve the uncertainty, for only a man is capable of limb movement. Now co-presence is a common feature and not a specific feature that can rule out fear of deviation. Thus the first observation of co-presence of the probans and the probandum boils down to observation of a common feature

without observation of a specific feature and fear of deviation is not removed. Hence awareness of absence of adjuncts that may be alleged to be gathered from the first observation alone is not reliable and open to doubt.

The above objection is raised from the viewpoint that an assumed doubt may block a perception. (For the claim is that the said kind of doubt blocks perception of pervasion.) If one disagrees, the objection may be sustained by holding that the sum total of the causal conditions of such doubt blocks perception (RS in JD 377).

Text. *Atha vyabhicārasamśayah na avyabhicāraniścayapratibandhakah grāhyasamśayasya niścayāpratibandhakatvāt anyathā samśayottaram kva api niścayah na syāt iti cet*? (205–6)

Tran. Objection: The fear of deviation is not an obstruction to determination of nondeviation, for an assumed fear cannot obstruct a belief; otherwise there could never be any belief after a doubt.

An objection is raised on behalf of Prabhakara. Gangesa has argued above that fear of deviation could very well attend the first observation of co-presence of the probans and the probandum and that this fear would obstruct determination of nondeviation simply from that first observation alone. Prabhakara counters by arguing that when co-presence learnt from the first observation is that of a probans proper with the probandum, fear of deviation is unfounded, for this probans does not actually deviate from the probandum. Here the fear is based merely on possibility of deviation and is an assumed (*grāhya*) fear. An assumed fear should not be an obstruction to a belief. An assumed fear from a mere possibility can crop up anywhere and anytime. If such fear could obstruct belief, there could never be any belief. No matter how well founded is some belief, there could always be an assumed fear of falsity or an assumed doubt. If this is an obstruction, the belief could not be there.

Text. *Na vyabhicārasamśayah pratibandhakah iti brūmah, kintu viśeṣadarśane sati sahacāradisādhāraṇadharmadarśanāt samśayah syāt na tu samśayasāmagrītah niścayah iti. Kiñca yaddhīsāmagrī yatra pratibandhikā viśeṣādarśane sati tatra taddhīh api iti vyabhicārasamśayah api pratibandhakah*. (207–8)

Tran. We do not (initially) say that fear of deviation is an obstruction. However, there should be the doubt (of possible deviation) if there is nonobservation of any specific feature and observation of common features such as co-presence: the causal conditions of doubt do not produce a belief. Further, whenever the causal conditions of an act of awareness constitute an obstruction, that awareness too is an obstruction as long as there is nonobservation of any specific feature. Thus fear of deviation too is an obstruction.

Gangesa disagrees. Prabhakara holds that the causal conditions of doubt serve as obstruction to a belief but not the doubt itself. One reason why Prabhakara holds this view is the apprehension that if an assumed doubt could be an obstruction there could never be any belief in anything. Since the causal conditions of doubt proper are not available when there is assumed doubt, assumed doubt alone is not an obstruction to belief and beliefs remain possible. But, Gangesa says, the argument that if an assumed doubt could be an obstruction, there could never be any belief in anything is unsound. In some situations, Gangesa argues later, doubt is ruled out by practical conflict. Further, it is not Gangesa's position that a belief is obstructed by merely a possible doubt or possibility of doubt. If someone holds that a belief is obstructed by a possible doubt or the possibility of doubt, there may be the difficulty over accounting for how there are any beliefs at all. But Gangesa holds that beliefs are obstructed by only actual doubts. Moreover, Gangesa spells out the exact conditions under which there is doubt. These conditions are: lack of observation of specific features and observation of common features. (Gangesa adds one more condition later.) Since there is doubt only when these conditions are fulfilled, there is (usually) no doubt when these conditions are not fulfilled. Thus there is (usually) no doubt if there is observation of specific features that are obstructions to doubt. For example, if one observes limb movement while having the doubt as to whether the thing in front is a man or a statue, the doubt is removed. Thus the conditions of doubt are not fulfilled everywhere and one should not suppose that there is everywhere actual doubt blocking each and every belief.

In other words, there is no harm in holding that an assumed doubt serves as an obstruction to a belief. If the doubt, for example, is due to a false observation of common features, it is an assumed doubt but still suffices to block a belief. But the doubt is removed if the falsity is detected and then the obstruction to the belief is also gone. Thus there is no insuperable harm in holding that whenever the causal conditions of an act of awareness serve as obstructions to a belief the said awareness too serves as an obstruction to a belief. Further, there is no harm in holding that there is no belief when the causal conditions of doubt are fulfilled.

JD observes, following RS, that presentation of opposed alternatives while there is no awareness of specific features and so on as long as these belong to the same person at the same time are the causal conditions of doubt [*Tathā ca viśeṣa-darśanābhāvādi-viśiṣṭa-virodhi-kotyupasthitireva saṃśaya-sāmagrī-padārthah . . . vaiśiṣṭyañca tatra eka-kālāvacchedena ekāmtmavṛttitva-rūpam*, JD 378]. These conditions are fulfilled for doubt of deviation at the time of the first observation.

This refutes the view that pervasion is grasped in the first observation of co-presence. Since observation of co-presence alone is observation of a com-

mon feature without observation of a specific feature, the causal conditions of doubt are present, producing actual doubt irrespective of whether it is an assumed doubt or not. This suffices to block the belief in pervasion.

Text. *Evam bhūyodarśanam api samśāyakam tarkah tu anavasthāgrastah eva iti katham vyāptigrahah*? (209)

Tran. Under the circumstances, since multiple observations too are subject to doubt and CR is beset with infinite regress, how can pervasion be grasped?

The single or the first observation as a method of generalization has just now been repudiated. Both multiple observations and counterfactual reasoning as methods of generalization have been repudiated earlier. No other method seems to be available. So how can generalization that is a crucial source of premises critically needed for a *nyāya* be accounted for and the skeptic kept at bay?

THE ACCEPTED VIEW OF THE METHOD OF GENERALIZATION: *VYĀPTIGRAHOPĀYASIDDHĀNTAH*

Text. *Atra ucyate. Vyabhicārajñānavirahasahakṛtam sahacāradarśanam vyāptigrāhakam. Jñānam niścayah śamkā ca. Sā ca kvacit upādhisandehāt kvacit viśeṣādarśanasahitasādhāraṇadharmadarśanāt. Tadvirahah ca kvacit vipakṣabādhakatarkāt kvacit svatah siddhah eva. Tarkasya vyāpti-graha-mūlakatvena anavasthā iti cet? Na, yāvāt āśamkam tarkānusaraṇāt. Yatra ca vyāghātena śamkā eva na avatarati tatra tarkam vinā eva vyaāptigrahah*. (210–12)

Tran. The following is to be said in this connection (i.e., the following is the accepted view). Observation of co-presence while there is lack of awareness of deviation is the method of generalization. A state of awareness is either a belief or a doubt. The latter is sometimes from the doubt over the possible presence of an adjunct and sometimes from observation of common features while there is nonobservation of any specific features. The absence of that (the doubt that the mark may be deviant) is sometimes due to a subjunctive reasoning that blocks the rival position (i.e., deviation or the lack of pervasion) and sometimes is *sui generis* indeed. Objection: Since CR presupposes pervasion, there is infinite regress. Reply: No, for one has recourse to CR only as long as there is doubt. Where there is no scope for doubt due to practical conflict, there for sure generalization takes place without having recourse to CR.

This is an important passage laying down the view favored by Gangesa on a thorny subject that goes back to Carvaka. Carvaka (sixth century BCE?) sys-

tematically challenged for the first time in the history of philosophy the status of inference as a source of reliable information. One main reason for this is the so-called problem of accounting for generalization. This problem is similar to the so-called Humean problem of induction in modern and contemporary Western philosophy as we have seen.

But there is a significant difference. The Carvaka critique is aimed at the disputable inductive leap from the observed to the unobserved but not at particular observations. The latter are accepted as reliable (unless falsified or rendered doubtful by other particular observations) by the Carvaka. The particular observations show that there are marks that deviate from the probandum, although these marks are in some cases co-present with the probandum. This shows without any disputable inductive leap that co-presence is not a sufficient condition for pervasion and that co-presence is compatible with deviation. This provides the ground (without any disputable inductive leap) for the doubt or fear of deviation that renders questionable the inductive claim. Further, the supporters of induction who bring in CR to justify induction themselves concede that in order to be reliable CR must be based on a reliable induction. So the Carvaka charge of circularity follows logically from what is accepted by the supporters of induction themselves. By contrast, the Humean argument seems to involve an inductive leap that is disputed by Hume himself. Hume argues that any induction assumes or presupposes the principle of uniformity of nature. Since this is a claim about all inductions, this claim itself cannot be sustained, one may object, without an induction. Thus the Humean critique of induction is itself based on an induction and, therefore, seems to be self-refuting. Further, the claim of Hume that an induction invariably presupposes the principle of uniformity of nature may be disputed and needs to be argued for. But the Carvaka critique is based on what is granted by inductionists themselves.

One may say that the law of causation provides justification of induction. That is, if two things are related as cause and effect, since the former is a necessary condition of the latter, one can generalize on that ground. For example, since fire is a necessary condition of smoke, one can generalize that wherever there is smoke there is fire. Both Hume and Carvaka, however, reject the law of causation. All that is observed repeatedly is that something comes into being after something else. It is not observed that the latter is a necessary condition of the former. But repeated observation of co-presence produces the habit, Hume says, to expect one in the presence of the other. In a similar vein, the followers of Carvaka too maintain that observation of succession does not amount to observation of causal connection and that our inductive claims are based on anticipation. This shows the substantial affinity that there is between Hume's and Carvaka's critiques of induction.

Still, Carvaka's critique is more comprehensive than Hume's critique. The former includes discussion of adjuncts and rejection of CR, the latter does not.

Now let us turn to Gangesa's reply to the Carvaka critique. Gangesa does not advocate nor repudiate either single observation or multiple observations as the method of generalization. His formulation of the method leaves open the possibility that pervasion may sometimes be grasped prima facie through single observation and sometimes through multiple observations. Such grasp of pervasion does not by itself remove the fear or doubt over deviation. The latter is to be achieved through CR. Such reasoning does not necessarily open the door of infinite regress, he claims. The reasoning is called for to remove doubt. But doubt is not inevitable. There are cases where the lack of doubt is *sui generic*—that is, there are cases where the conditions of doubt are not fulfilled; there are still other cases where doubt is removed by practical conflict. More light is thrown on these crucial points in the next chapter on CR.

Gangesa has said that lack of perception of deviation is a causal condition of perception of pervasion. RS comments that such lack of perception of deviation should not be thought to be lack of perception of the probans being present where the probandum is absent. If a probans is present where the probandum is absent, it is deviant. Such perception of deviation is an obstruction to generalization and lack of the former is no doubt relevant as absence of an obstruction. RS does not mean to reject that. His point is that the above account does not apply to every pervasion. If the probandum happens to be omnilocated (*kevalānvayin*), it is not absent anywhere; then it is not possible for the probans to be absent where the probandum is absent. Since the negatum is impossible, its negation is unacceptable too according to a commonly accepted Nyāya tenet. Thus lack of perception of deviation, if interpreted in the above way, does not apply to every pervasion, for something impossible cannot be a causal condition [*Sādhana-gocara-sādhyābhavāvadvṛttitvagrahābhāvo heturiti na yuktam, kevalānvayini grāhyāprasiddhyā grahāprasiddheh*, RS in JD 378–79]. Bhavananda remarks as follows. When RS speaks of the cognitum (*grāhya*) being unaccepted (*aprasiddha*), he means that in some cases the fact of being present where the probandum is absent is unaccepted (TCDP I, 567). As explained above, this is unaccepted in some cases because in some cases the probandum is omnilocated. GD notes explicitly that what is meant by "omnilocated" is the case where the probandum is omnilocated [*"Kevalānvayini" kevalānvayi-sādhyake*, GD 663]. In this case the condition of belonging to where the probandum is absent cannot be realized (for the probandum is everywhere and is not absent anywhere); hence perception of belonging to where the probandum is absent too is impossible [*Sādhyābhāvavadvṛttitvāprasiddhyā tadgrahāprasiddheh*, GD 663]. Since such a negatum is impossible, the said lack of perception is also a nonentity and cannot be a casual condition of the

perception of that kind of pervasion [*Evanca pratiyogyāprasiddhyā tādṛśa-grahābhāsya aprasiddheh tatsthalīya-vyāpti-jñāne vyabhicārāgrahasya hetutvāsambhavah*, GD 663]. GD hastens to add that RS does not imply that Gangesa is suggesting that lack of perception of deviation is a condition of perception of pervasion in all cases [*Dūsanañca sarvatraiva vyabhicārāgrahasya vyāpti-grāhakatvam mūlābhipretam ityabhimaānena. Abhimānañca . . . nirākariṣyate*, GD 663].

RS suggests that the following account is closer to the mark. So far as a given person is concerned, not perceiving that the specifier of probandumness is the specifier of negatumness of an absence belonging to the locus of the probans is a causal condition of that person's perception of pervasion [*Sādhyatāvacchedake tat-puruṣīya-tādṛśāvacchedakatva-grahasya viṣayatayā abhāvah . . . tat-puruṣīya-vyāpti-grahe hetuh*, RS in JD 379]. The reference to a given person is included because while one particular person may be aware that a certain probans is deviant, another may still surmise that that probans is pervaded by the probandum.

RS implies that an account that applies to all cases of pervasion and all cases of deviation is hard to find. GD says this explicitly [*Sarva-sādhāraṇa-vyāpti-grahatva-vyabhicāra-grahatvayoh durvacatvāt*, GD 666]. RS suggests further that pervasion is different due to the probans or the probandum of different natures. That is, pervasion involving an omnilocated probandum, say, is different from pervasion involving a probandum that is present in some places and absent in some others. If different kinds of pervasion are identified, the causal condition of each kind may also be specified accordingly [*Vastuto vyāpteh sādhya-sādhana-bheda-bhinnatayā viśiṣyaiva kārya-kāraṇa-bhāvah*, RS in JD 381]. In fact, one can go further. One can say that pervasion is different as the probans or the probandum is different. Thus not only lack of perception of deviation may be specified differently for different kinds of pervasion but also lack of perception of deviation of a particular probans may be singled out for a given particular pervasion [*Tat-sādhyaka-tat-sādhanaka-vyāpti-grahatvam tat-sādhanaādi-dharmika-tat-sādhyābhavavadvṛttitvādi-grahābhāvatvādi-rūpa-viśeṣa-dharmavacchedena*, GD 666]. It follows that although in a given case there is absence of perception of one kind of deviation, there is perception of another kind of deviation and there may be still obstruction to perception of pervasion [RS in JD 381]. Thus lack of perception of deviation is useful for an account of the method of perception of pervasion. In some cases the former is impossible (for in some cases deviation is impossible, so that perception of deviation as well as absence of the latter is impossible); still, it is relevant in most cases [RS in JD 382]. Bhavananda observes as below. In some cases there may be only one kind of awareness of deviation. In these cases lack of that is a causal condition. In other cases there may be dif-

ferent kinds of awareness of deviation. In these latter cases lack of all of these is a causal condition [TCDP I, 569].

We have been exploring the method of grasping pervasion. One obvious question here is: what is pervasion? Since many different answers have been given, RS offers an account of pervasion that is addressed to the present context. Pervasion is reducible to smokeness and so on that belongs to something that is co-located with fire that pervades smoke and so on, RS says [*Vyāptiśca dhūmādi-vyāpaka-vahni-samānādhikaraṇa-vṛtti-dhūmatvādikam*, RS in JD 384]. Bhavananda comments thus. Lack of awareness of deviation is a causal condition of awareness of pervasiveness; awareness of co-location is a causal condition of awareness of co-locatedness [TCDP I, 571].

It may be noted that since the probans is said to be pervaded by the probandum, pervasion may be construed as a feature of the probans. The question then is: pervasion should be reduced to which feature of the probans that makes most sense? The point of the present account is that reducing pervasion to the qualifier of probansness as specified makes most sense. The example of probans under consideration is smoke and the pervasion of smoke by fire may be construed as a feature of smoke. Smokeness is an already accepted feature of smoke. It is also accepted that smokeness belongs to all smokes and nothing but smokes. Given that, RS suggests that pervasion of smoke may be understood as smokeness as specified. This is consistent with that pervasion of smoke by fire is a feature of all smokes and nothing but smokes unless something else too is related in exactly the same way to fire. This is why RS speaks of smokeness and so on as well as the smoke and so on in case other things too are related in the same way to fire. Needless to say, the account is meant to apply to all pervasions by replacing smoke and fire with any other intended probans and probandum respectively. Still, this account is not meant to be a definition (*lakṣaṇa*) of pervasion, for the word "pervader" (*vyāpaka*) is included in the account and that would have invited the charge of circularity. However, the account is not unnecessarily verbose. If the word "pervader" were dropped, the account would overextend to common features of things that are merely co-located with fire without being pervaded by it.

Should not pervasion be explained as being co-located with the pervader? Being co-located with the pervader is also a feature of the probans. This further appears to be more compact than the above feature. So what is the justification for the more complex account?

One possible answer is that being co-located with the pervader would have to be reduced to something already accepted in the favored ontology. In the light of that ontology reduction to smokeness and so on makes sense, for these are unitary and natural features; this eventually leads to economy (*lāghava*).

Moreover, many Nyāya philosophers are not inclined to accept universal-based (*sāmānya-lakṣaṇa*) extraordinary sensory perception. For them pervasion must be grasped through the accepted ordinary sensory connections. From this point of view too reducing pervasion to smokeness and so on makes good sense [*Sāmānya-pratyāsatti-anabhyupagama-pakṣe…samānādhikaraṇa-vṛtti-hetutāvacchedakasya vyāptitvam āvaśyakam*, GD 668].

Gangesa has said that nonperception of deviation and perception of co-presence are elements of the method of generalization. How does that fit with the above account of pervasion? RS suggests the following. There are two main ideas in the said account. First, there is reference to pervasiveness. Nonperception of deviation contributes to the grasp of that. Second, there is the idea of belonging to something that is co-located. Perception of co-presence contributes to that [RS in JD 384].

However, the precise way in which Gangesa formulates the method is different from the precise way in which RS does. Gangesa formulates the method as perception (or awareness) of co-presence as qualified by absence of perception (or awareness) of deviation (*vyabhicāra-jñāna-viraha-sahakṛta-sahacāra-darśanam*). In this formulation perception of co-presence is the chief qualificand. On the other hand, RS formulates the method as absence of perception (or awareness) of deviation as qualified by perception (or awareness) of co-presence. In this formulation absence of perception of deviation is the chief qualificand. Thus the RS account implicitly highlights the role of absence of perception of deviation. One reason for this is that in some cases of erroneous inference the mark is present only where the probandum is absent. Here no true perception of co-presence of the mark and the probandum is possible. Nevertheless, there is no bar to there being absence of perception of deviation in such a case. That is, although the mark is always deviant from the probandum in this case, one may not be aware of that. Further, nondeviation rather than co-presence is the more crucial fact in pervasion, for even a deviant mark is in some cases co-present with the probandum. Accordingly, absence of awareness of deviation is a necessary condition for awareness of pervasiveness (*vyāpakatva*). Pervasion cannot be grasped if there is awareness of co-presence without absence of awareness of deviation. This shows that the causal conditions of awareness of pervasiveness are different from the causal conditions of awareness of co-location. As JD observes, in some cases both sets of causal conditions may be available at the same time; then both may be grasped at the same time. But in other cases one set may succeed another set; then they will be grasped in succession [JD 385; RS in JD 385]. At any rate, there is no good reason to give any precedence to perception (or awareness) of co-presence over absence of perception (or awareness) of deviation. There is also no good reason to hold that perception (or awareness) of co-presence suffices as

a causal condition of perception (or awareness) of pervasion by itself (*svātantryeṇa*) [*Vyāpti-grahe sahacāra-grahasya svātantryeṇa hetutāyāh niryuktikatayā*, GD 667]. At the same time, it should not be held that perception (or awareness) of pervasiveness suffices as a causal condition of perception of co-presence by itself if it is accepted that in some cases a probans is related to the probandum only by way of universal co-absence (*kevala-vyatireka*) and not by way of co-presence. If the probans is related to the probandum only by way of universal co-absence, the probandum pervades the probans although the two are never co-present.

Another issue may now be taken up. A key idea in some accounts of the concept of pervasion is that the probandum is not the negatum of any absolute absences that reside in the loci of the probans. To avoid some difficulties this is sometimes refined as follows: the specifier of probandumness is not the specifier of negatumness of any absolute absences that reside in the loci of the probans. When pervasion is understood thus, one may also explore the precise way in which this is grasped. Could it be grasped by ordinary sensory connections that are accepted in the Nyāya system? No. For no ordinary sensory connection with all loci of the probans is possible; the negative entities belonging to all such loci cannot accordingly be perceived, and it cannot be known from ordinary perception that the specifier of probandumness is not the specifer of negatumness of any such negative entities [*Yāvatām ca dhūmavatām ekadā sannikarṣa-virahāt na sa sambhavatīti tādṛśa-avacchedakatvābhāvo na laukika-pratyakṣa-viṣaya*, JD 365]. But this reopens the threat of an infinite regress: the statement of pervasion is a premise in a probans-centered inference; if pervasion is grasped by such inference or some other indirect means of knowing, how can the regress of prior steps be stopped [*Laukika-pratyakṣa-asambhavena jñānāntara-sāpekṣasya . . . anumānaderapi asambhavāt*, GD 671]?

One solution to this problem is to rely on the kind of extraordinary perception in which a cognitive state provides the sensory connection. This is already accepted to explain such an associative perception as the visual perception of a piece of sandal as fragrant. Suppose that the sandalwood is at a distance and so the nose does not perceive fragrance. Suppose also that the requisite conditions of other accepted methods of knowing, such as inference, are not applicable. Under the circumstances, since such associative perception is possible only when the percept is already familiar, the previous perception and its remembrance may be taken, consistently with a realistic epistemology, to provide the sensory connection needed for such extraordinary perception.

If this is accepted, it may provide a way to grasp pervasion. Since smoke and fire, say, are discrete events or states, they are not logically connected, but they can be connected through association. The relevant step is to connect the

specifer of probandumness with the negation of the said specifier of negatumness. For this to be possible the negation of the said specifier of negatumness must be already familiar. But how can that happen when no ordinary sensory connection with all the loci of the probans is possible? A way out (although other solutions may be also offered) is to have recourse to linguistic (*śābda*) analysis. It can be known through linguistic analysis alone without the need for sensory connection with all loci of smoke that smoke is not absent in any such loci. Thus smokeness may be known not to be the specifer of the negatumness of such absences. Since thus the said idea is already familiar, it may then be connected to the specifier of probandumness, such as fireness, through association. That is, it may be perceived, with the help of the remembrance of the associated idea, that the specifier of probandumness is not the specifier of such negatumness [RS in JD 385–86; *kathañcit śabdādina*, JD 385].

This move by having recourse to association is not surprising for a Nyāya empiricist. The pervasion concerned deals with two discrete events or states that are not logically connected. A rationalistic necessitarian view of nature is unacceptable to the Nyāya. From the latter point of view the causal model is founded on regular succession as observed. When two things are regularly associated in observation, the assumption of a deeper connection is natural from this viewpoint unless other evidence countermands that: thus the said move.

Such appeal to association is somewhat similar to the Humean view. However, to a Humean empiricist such association is a mental activity and does not reveal an objective connection in the nature of things. But a Nyāya empiricist does not credit the inner sense (*manas*) or the self (*ātman*) with making the kind of contribution that would prevent a routine association from revealing an objective connection (unless there is evidence to the contrary). So an associative perception is reliable for grasping pervasion from the Nyāya point of view (unless there is counterevidence).

Still, similarity with the Humean view is significant in another respect. A Humean rejects an idea as spurious unless it is properly derived from an impression. For example, a Humean rejects the idea of causal power because it is not copied from an impression. Thus to a Humean the reliability of an idea is linked to a certain process that legitimizes it and disallows the introduction of what is perceived to be nonempirical. To a Nyāya empiricist too the reliability of an idea is linked sometimes to certain processes that legitimize it and disallows the introduction of anything nonempirical unless the non-empirical is demonstrably needed for the explanation of something empirical. Hence the exploration for the negation above, viz., that the specifier of probandumness is not the specifier of the said negatumness. The underlying assumptions of the two systems are not the same. Nevertheless, certain strategies are similar.

4

Counterfactual Reasoning: *Tarka*

Text. *Tathāhi dhūmah yadi vahni-asamavahita-ajanyatve sati vahni-samavahita-ajanyah syāt na utpannah syāt*. (219)

Tran. In this connection if smoke were not produced by what is not concomitant with fire nor by what is concomitant with fire, smoke would not have been produced (i.e., if smoke were not produced either by a sum total of causal conditions that excludes fire or by a sum total of causal conditions that includes fire, smoke would not have been produced).

Gangesa states the counterfactual/subjunctive reasoning (CR: *tarka*) that is needed as a support (*anugrāhaka*) for the generalization that all smoky things are fiery. [It may be noted that smoke and fire are here variables for any two things related as the effect and the causal condition respectively. Hence the subjunctive reasoning involving smoke and fire applies to any empirical induction based on causation.] We first look at some introductory remarks of RS. RS comments that when one observes co-presence and co-absence of smoke with fire (which is a causal condition of smoke), donkeys (which are not causal conditions of smoke) and so on, one determines that for sure one of these is a causal condition of smoke. One may indeed have the doubt if all of these are causal conditions or some are but some are not. When smoke is observed to be produced from others in spite of something (such as donkeys) being absent, that thing is found not to be a causal condition. On the other hand, when it is observed that smoke is not produced in spite of the presence of all the others except something such as fire, that latter is found to be a causal condition [*Hutāśana-rāsabhādi-padārtha-sārthasya anvaya-vyatirekayoranvaya-vyatirekau dhūmasya upalabhamānah avaśyam eteṣām anyatamam kāraṇam*

dhūmasya iti avadhārya sandigdhe kimetāni sarvāṇyeva kāraṇāni kim vā kanicit tathā kanicicca neti, atra ca yasya vyatireke api itarebhyastathāvidhebhyo dhūmotpattim upalabhate tasya ahetutvam eva avadhārayati yathā rāsabhādeh, yasya vyatireke tādṛśa-apara-sakalānvaye api dhūmānutpattim paśyati tasya kāraṇatvameva niścinute yathā vahneh, RS in JD 388–89].

Bhavananda notes here that the above reasoning of Gangesa is not the same as the more common CR that goes as follows: if smoke were deviant from fire, it could not be an effect of fire, and so on. It is the latter that is directly conducive to supporting the induction (*vyāpti-grāhaka-tarka*) that all that is smoky is fiery. Still, the above reasoning of Gangesa helps to support the causal connection (*kārya-kāraṇa-bhāva-grāhaka-tarka*) between smoke and fire and thus indirectly supports the said induction (TCDP II, 579).

Returning to RS, the point is that the causal inquiry usually begins when we observe something to be correlated with some other things. One main task of such inquiry is to recognize what is a causal condition and what is not. Accordingly, RS has laid down two basic principles of causal reasoning. First is a principle of elimination that separates what is not a causal condition from what is, viz., that if something is observed to come into being without something, the latter is not a causal condition of the former. This is a corollary of the principle of co-presence (*anvaya*) that wherever there is the effect there is the causal condition or the sum total of causal conditions (also wherever there is the sum total of causal conditions there is the effect: *tat-sattve tat-sattā*; the word *tat* or that could mean the sum total of causal conditions in the first occurrence and the effect in the second occurrence, then we have the second version, or *tat* could mean the effect in the first occurrence and the causal condition or the sum total of causal conditions in the second occurrence, then we have the first version). Second is a principle of recognition that if something is observed not to come into being when everything else is available except something, the latter is a causal condition of the former. This is a corollary of the principle of co-absence (*vyatireka*) that wherever there is absence of a causal condition there is absence of the effect (*tat-asatte tat-asattā*). In the view of many Nyāya philosophers these two principles are not equivalent and one does not necessarily follow from the other.

Bhavananda observes that it is the principle of co-absence (*vyatireka*) that helps to obstruct the doubt that smoke may sometimes arise without fire. He grants that since plurality of causes is prima facie plausible (for fire, for example, is observed to be produced from grass, wood, magnifying glasses and so on: *tṛṇa-araṇi-maṇi-nyāya*), one may have the doubt that smoke may sometimes be produced with the help of something other than fire. But the fact that smoke is not produced when all other conditions of the observed totality with the exception of fire are present blocks the doubt (TCDP II, 580).

It may be noted that smoke and fire represent any two things related respectively as an effect and a causal condition. It is implied that when the probans and the probandum are related as an effect and a causal condition, the same form of subjunctive reasoning is useful to support the generalization of the form that wherever there is the effect there is also the causal condition or that wherever there is the probans there is also the probandum.

Gangesa presents the alternatives that smoke is produced by either a sum total of things that includes fire or excludes fire. The two alternatives are mutually exclusive and collectively exhaustive. As Mathuranatha points out, all produced things are either produced by a sum total of causal conditions that excludes fire or includes fire. Here the place of fire can be taken by any other causal condition. The point is that all produced things are either produced by a sum total of causal conditions that excludes a given particular causal condition or includes that given particular causal condition. Thus it follows logically that if something is neither produced by a sum total of causal conditions that excludes fire nor by a sum total of causal conditions that includes fire, it is not produced [*Janyam hi jagati vastu-dvayam vahnyasamavahita-janyam tat-samavahits-janyam ca tatra ayam cet ubhaya-janya eva na syāt tada janya eva na syāt*, MN 219].

Thus, it follows that if something is produced neither by a sum total of causal conditions that excludes a given particular causal condition nor by a sum total of causal conditions that includes that given particular causal condition, it is not produced. It is a logical truth that all sum totals of causal conditions either exclude fire or include fire. Similarly, it is a logical truth that all sum totals of causal conditions either exclude a given particular causal condition or include that given particular causal condition. The sentence that all sum totals of causal conditions either exclude a given particular causal condition or include that given particular causal condition or the sentence that all sum totals of causal conditions either exclude fire or include fire may look like an ordinary induction, such as that all smoky things are fiery. But they are not. The latter is in the form all S is P. This is not a logical truth. But the former are in the form that all S is P or not-P. This is a logical truth. The genius of Gangesa lies in discovering how certain logical truths (together with the epistemic principle OC that is understood) can be utilized in supporting an empirical generalization and thereby countering the skeptical doubt.

Many twentieth-century philosophers have held that a logical truth is superfluous as a premise in a deduction of an empirical truth. One reason for this is as follows. Truths are divisible, one may hold, into logical and empirical truths. If it is a logical truth, it is provable from any set of premises (including the null set); hence any logical truth is superfluous for the proof of a logical truth. On the other hand, an empirical truth has a factual content that goes

beyond any logical truth. Since the factual content can only be derived from other empirical truths, a logical truth is dispensable for the proof of any empirical truth as well.

One may agree or disagree with the above view. But even if one agrees, it does not follow that a logical truth could play no role in the justification of an empirical truth. Such justification is an epistemic argument that is significantly different from a merely inductive proof. Unless it is proved that the dichotomy between logical and empirical truth is exhaustive and exclusive, the role of logical truth in this process is not ruled out *ab initio*.

Refinements aside, Gangesa's reasoning may be summed up as follows. Either smoke is produced or not. Since these are mutually exclusive and collectively exhaustive alternatives, we must choose one and reject the other. As long as our particular observations are accepted as reliable and OC (that is presupposed in holding that particular observations are reliable) is accepted, we should choose that smoke is produced. For we observe that smoke comes into being where there was no smoke. Thus we observe that something that was nonexistent before is existent now (*prāgabhāva-pratiyogin*). Since this is what is meant by being an effect or being produced, that smoke is produced is favored by OC and is preferred. Now, if smoke were produced neither by an aggregate that excludes fire nor by an aggregate that includes fire, smoke would not be produced. But we know that smoke is produced. That is, we know that the consequent of this conditional is false. It then follows from the law of *modus tollendo tollens* that the antecedent of the conditional is false. Thus it follows that smoke is produced by either an aggregate that includes fire or excludes fire. Once again, we need to choose between (a) that smoke is produced by an aggregate that includes fire and (b) that smoke is produced by an aggregate that excludes fire. As long as OC is accepted and it is also accepted that our particular observations are reliable, we should choose the former. Clearly, the latter is also logically possible but is nevertheless less acceptable than the former, for there is no observational support for the latter while there is such support for the former. Now, accepting the alternative that smoke is produced by an aggregate that includes fire favors accepting that fire is a constant causal condition of smoke and thus that the induction that wherever there is smoke there is fire is reliable.

Needless to say, the above solution is not in its entirety explicitly stated by Gangesa but is nevertheless a reformulation of his compact statements. We label it as the deductive-epistemic justification of induction.

It may be noted that one possible skeptical challenge to the above solution comes from the doctrine of plurality of causes and another from the doctrine of accidentalism. The Nyāya response to such challenges has already been discussed in the Introduction.

It may again be noted that at no point in the above argument the mere logical possibility of doubting an induction is ruled out. In some sense the skeptical challenge to induction may be founded on this. To that extent Gangesa agrees with the skeptical opponent. But, unlike the skeptic, Gangesa does not find this to be detrimental to the reliability of induction. One reason for this optimism is that just as the mere possibility of doubting an induction cannot be ruled out, so also the mere possibility of backing an accepted induction with CR cannot be ruled out. In other words, as long as one keeps on doubting an inductive premise, a counterargument in the form of CR can also be provided and this process can go on indefinitely. Thus the case for doubt is not any stronger than the case for blocking the doubt. But additionally the case for blocking the doubt is strengthened by arguments for the causal law and rejection of plurality of causes explained in the first two chapters. This tilts the balance in favor of reliability of induction.

Further, Gangesa would argue later in this chapter that the doubt is also blocked by unwavering action. This latter argument does not address the question of the mere possibility of doubt but rather the presence of doubt as an actual state: when one acts unwaveringly in a way that presupposes one's confidence in an induction, there is no reasonable ground to claim that one still harbors any actual doubt. In such a case there is no need for continuing the process of countering the doubt with CR any further.

> Text. *Iti atra kim dhūmah avahneh eva bhaviṣyati kvacit vahnim vinā api bhaviṣyati ahetuka vā utpatsyate iti śamkā syāt*. (219–21)

> Tran. In this connection there could be doubt from supposing whether smoke always comes into being without fire or sometimes comes into being without fire or is uncaused.

Gangesa takes note of three possible ways in which a skeptic could try to block the CR introduced by him as a justification of the induction that all smoky things are fiery. (Here smoke and fire are intended, as said before, to be substitutes for any pervaded [*vyāpya*] and any pervader [*vyāpaka*] related as effect and cause respectively.) The first possible supposition is that smoke always comes into being without fire. This is opposed to that all smoky things are fiery, for it amounts to saying that no smoky things are fiery. "All smoky things are fiery" and "no smoky things are fiery" are contraries and both cannot be true together (although both could be false: it may be that some smoky things are fiery and some are not). So if "no smoky things are fiery" is true, "all smoky things are fiery" must be false.

The second possible supposition is that sometimes smoke comes into being without fire. This amounts to saying that some smoky things are not fiery. "All

smoky things are fiery" and "some smoky things are not fiery" are contradictories and the truth of one implies the falsity of the other (and the falsity of one implies the truth of the other). So if "some smoky things are not fiery" is true, "all smoky things are fiery" must be false.

The third possible supposition is that smoke is uncaused. If smoke were uncaused, either "no smoky things are fiery" or "some smoky things are not fiery" could be true. In either case "all smoky things are fiery" would be false.

It may be noted that the supposition that smoke is uncaused comprises several possibilities: (a) smoke is something unreal (*alīka*) and does not exist; something that is unreal and does not exist is uncaused. (b) Smoke is something eternal (*nitya*); an eternal thing is uncaused. (c) Smoke is accidentally produced—that is, although smoke comes into being, it is not invariably preceded by any given causal condition.

The alternatives (a) and (b) are refuted by observation that smoke comes into being after being nonexistent before. If our observation of smoke coming into being is credible, it refutes both that smoke does not exist and that it is eternal. Some arguments for the rejection of (c) have been explained earlier.

> Text. *Sarvatra svakriyāvyāghātah syāt. Yadi hi gṛhīta-anvayavyatirekam hetum vinā kāryotpattim śamketa tadā svayam eva dhūmartham vahneh tṛptyartham bhojanasya parapratipatyartham śabdasya ca upādānam niyamatah katham kuryāt. Tena vinā api tatsambhavāt. Tasmāt tattadupādānam eva tādṛśaśamkāpratibandhakam.* (221–30)

> Tran. With respect to each (of the above suppositions implying the falsity of that all smoky things are fiery) there should be conflict with one's own action. If one should entertain the doubt that an effect that is observed to be related by way of co-presence and co-absence with a causal condition could also be produced without the latter, why should one regularly obtain fire for smoke, eat for nourishment and have recourse to words for communication with others? For that (i.e., the chosen effect) could also be without that (i.e., the specified causal condition). Therefore, the unwavering procurement of the same causal conditions itself is the obstruction to that kind of doubt.

Gangesa gives a common objection to the above skeptical suppositions. In the Nyāya view our voluntary actions are preceded by awareness of a goal and the awareness that the action leads to the goal. Actions like lighting up a fire to produce smoke, consuming food to have nourishment, speaking or writing down words to communicate with another person are voluntary actions. Accordingly, a person who lights up fire to produce smoke is aware of the goal of producing smoke and also aware that the action of lighting up fire leads to that goal. Similarly, a person who seeks nourishment and eats is aware of nourishment as the goal and also that eating leads to nourishment. Again, a person

who speaks or writes down words to communicate with another person is aware of the goal of communication with another person and also aware that speaking or writing down words leads to that. Now, one who does the same thing again and again to get to the same goal and never resorts to anything else is not only aware that certain actions lead to certain goals but is also convinced that such actions lead to such goals. Otherwise one would have experimented with other courses of action. So the fact that a skeptic regularly writes down or speaks words to communicate with another person shows that the skeptic has the conviction that such an action is needed for achieving the goal. Similarly, the fact that a skeptic regularly eats to have nourishment shows that the skeptic has the conviction that eating is needed for nourishment. Being convinced about something is opposed to being doubtful about it. So a skeptic who regularly procures a causal condition to bring about an effect and still says that he/she is doubtful about it is a hypocrite.

This argument presupposes certain views regarding our knowledge of other minds. The latter is a difficult philosophical problem in its own right and we cannot go into a proper discussion of it here. But we shall briefly indicate the Nyāya position on this. In the Nyāya view we can directly know (in a fallible way) what is going on in our own minds but not what is going on in somebody else's mind. We can, however, make reasonable inferences about what is going on in other peoples' minds. If induction cannot be justified, such inferences that presuppose induction cannot also be justified. So unless induction is justified, it may very well be that our knowledge of other minds cannot be justified either—at least this is the Nyāya view. If this is accepted, this gives one more reason to hold that induction is reliable. Otherwise one may have to give up the hope of solving the problem of our knowledge of other minds.

Carvaka and Hume held that we could entertain a theoretical doubt about induction and still carry on with our practical activities in daily lives. This sounds plausible because we may presumably draw a distinction between theoretical certainty and practical certainty in certain matters. For example, it is theoretically possible to defeat a political party in a democratic election. But in a given case this may be practically ruled out because that party may be much more popular than its rivals or because the party has an iron grip over the entire electoral process and would not allow the opposition to win as long as it stays in power and so on. In such a case it is practically certain that the party will win the election though it is theoretically possible that it may not.

This illustrates that it may be reasonable to distinguish between theoretical certainty and practical certainty in matters about external facts. However that may be, it does not follow from that this is also reasonable when applied to internal facts about our own minds. At least it needs an argument but Carvaka or Hume does not provide one.

From the Nyāya point of view, such a cleavage between theoretical certainty and practical certainty is unreasonable when applied to internal facts about voluntary actions. Not that we have an infallible grasp of what goes on in our own minds. The latter is indeed the view of some rationalists. But in the Nyāya view, although we are directly aware of our own internal states, such awareness is fallible. Still, our direct perceptions of our own internal states are, except when countermanded, reliable. At least, the reliability of our awareness of our own mental states is not at issue here. Accordingly, it is reasonable to claim that our conviction about something is opposed to our being doubtful about it and rules the doubt out. That is, there is no reliable evidence to claim that we still entertain a theoretical doubt in such a case. The issue, once again, is not one of logical possibility but of actual existence of a state of mind. Hume or Carvaka are not entitled to claim that this is actually so without producing the needed evidence. We have already seen that unless induction is justified, at least in the Nyāya view it is not possible to justify our knowledge of other minds either. Accordingly, if Hume or Carvaka need to claim that we can entertain a theoretical doubt about matters regarding which we are practically certain, they need to make claims about our knowledge of our own minds as well as other minds and, if the Nyāya view is accepted, such claims about our knowledge of other minds cannot be justified if induction is not. Thus there appears to be a gap in the skeptic's reasoning here.

Gangesa's position may be said to derive support from recent research on cognitive dissonance.[1] Such studies show that we find consciously holding on to conflicting beliefs discomforting and try to resolve the conflict in some way or other. If this is acceptable, the conflict between theoretical doubt and practical certainty should also be discomforting and should be resolved. There is little doubt that this gets to be resolved in favor of practical certainty, for there is no observational support for the theoretical doubt.

Moreover, Gangesa seems to have deliberately chosen examples of induction that a skeptic can ill afford to dispute in a practical way. A skeptic who joins the debate over induction does want to communicate his/her views to others. For communication with others, a skeptic has no choice but to utter or write down words. The only other alternative for a skeptic seems to be to maintain silence and refrain from taking an active part in the debate. Similarly, a skeptic has no choice but to eat in order to survive. No skeptic within his/her senses will give up eating to demonstrate that he/she as a matter of fact has some lingering doubt about whether eating is necessary for survival. Thus the skeptic is not in a position in such down-to-earth cases to produce even an iota of evidence that an actual (and not merely a possible) doubt is present and avoid the charge of being a hypocrite. Recent studies of cognitive dissonance alluded to above thus make the skeptical position more questionable.

> Text. *Śamkāyām na niyatopādānam niyatopādāne ca na śamkā. Tat idam uktam tat eva hi āśamkyate yasmin āśamkyamāne svakriyāvyāghātah na bahvati iti. Na hi sambhavati svayam vahnyādikam dhūmādikārya-artham niyamatah upādatte tatkāraṇam tat na iti āśamkyate ca iti.* (230–32)

> Tran. If there is doubt, there is no regular procurement (of a causal condition to produce an effect) and if there is regular procurement, the doubt is not there. It has indeed been said that one should entertain doubt only about that which does not involve conflict with one's own action. It is not reasonable that one regularly obtains fire and so forth for the sake of effects like smoke and so forth, and still harbors the doubt that this is not a causal condition of that.

Gangesa argues that belief-behavior contradiction is a sufficient ground for rejecting a belief. If one holds certain beliefs but regularly does things that are opposed to such beliefs, those actions provide a sufficient ground to cast doubt on the claim that one actually holds such beliefs. Regarding this recent study on cognitive dissonance mentioned above may lend support to Gangesa's position and go against the tenability of skeptical doubt. One special case of this is the skeptical doubt over something like fire being a causal condition of something like smoke. If the skeptic were actually doubtful about fire being a causal condition of smoke, the skeptic would not regularly light up fire to produce smoke. If, however, the skeptic regularly lights up fire to produce smoke, that behavior is sufficient to cast doubt on the presence of such doubt. Such voluntary action is preceded by the belief that fire is a causal condition of smoke and this is opposed to the doubt about this matter. The doubt is of the form that fire is a causal condition of smoke or not. This comprises in part the alternative that fire is not a causal condition of smoke. This part is opposed by the belief that fire is a causal condition of smoke. Thus the skeptical challenge ends when it invites belief-behavior contradiction.

Thus, it is more reasonable to think that there is no doubt if there is such regular behavior rather than to think that there is doubt if there is such regular behavior. That is, as between the two claims that there is doubt and that there is no doubt in such a case, the latter is preferable to the former in the light of the best evidence available (including recent studies on cognitive dissonance).

MN suggests that the text that if there is doubt there is no regular procurement should be interpreted as that if there is doubt there is no awareness of universal inclusion and universal exclusion; indeed, the doubt is an obstruction to the latter awareness. [*Śamkāyām utpadyamānāyām . . . "na niyatopādānam" na anvaya-vyatireka-anuvidhāyitva-jñānam.*] Similarly, MN suggests, the text that if there is regular procurement the doubt is not there should be interpreted as that if there is awareness of universal inclusion and universal exclusion the doubt is not there. [*"Niyatopādāne ca" anvaya-*

vyatireka-anuvidhāyitva-jñāne ca, "na śamkā" ityarthah.] Thus the text "regular procurement" may, without violating the rules of Sanskrit grammar, be read as "that from which there is regular procurement." [*Niyatam upādānam yasya iti vyutpattyā niyatopādāna-padasya anvya-vyatireka-anuvidhāyitva-jñāna-paratvāt.*] The reading of MN too may be said to derive support from recent studies on cognitive dissonance.

> Text. *Etena vyāghātah virodhah sa ca sahānavasthānaniyamah iti tatra api anavasthā iti nirastam. Svakriyāyāh eva śamkāpratibandhakatvāt.* (232)

> Tran. By this is refuted the following: Since conflict is opposition and since that is invariable non-concomitance, there too is infinite regress. For one's own action for sure is the obstruction to the doubt.

The skeptic's objection is that conflict cannot resolve the doubt over pervasion. Conflict is nothing but opposition and the latter is nothing but invariable non-concomitance. That is, two things are opposed if they are never together. For example, eternality and non-eternality are opposed and they are never found in the same thing: there is nothing that is both eternal and non-eternal. So conflict presupposes pervasion; if the reasonableness of any pervasion is in doubt, such doubt cannot be removed by that which itself is dependent on pervasion. If that is attempted, it can only lead to one pervasion presupposing a second pervasion and so on to infinity.

Gangesa responds that his argument from belief-behavior conflict does not involve an infinite regress. The pervasion under investigation is about external things like smoke and fire. The doubt over such a pervasion is an internal state that arises only under certain conditions. In order to have such a doubt, for example, one must be able to entertain the belief that fire is not a causal condition of smoke. But this is opposed and removed by the belief that fire is a causal condition of smoke. It is the latter belief that is found in someone who regularly procures fire to get smoke. Thus the requisite conditions for doubt are missing (and this is supported by recent studies on cognitive dissonance). Since the doubt cannot be justifiably claimed to be there, no reasoning to remove the doubt that might involve infinite regress is called for.

A skeptic like Carvaka or Hume is in difficulty when such a skeptic has to justify certain claims. Just as an inductionist has to justify the claim for induction, so also a skeptic has to justify the claim about the existence of doubt as an actual internal state. The latter happens under certain conditions. If the skeptic cannot show that those conditions are fulfilled, the claim that the doubt is there is not justified. Moreover, one's own action to procure something regularly to produce something else provides the evidence that one has

the belief that the former is a causal condition of the latter. This lends support to the claim that the doubt is not there.

The claim that the doubt is not there is a reliable assertion; but it is not meant to be an assertion that is beyond challenge. The skeptic likes to raise the standard of acceptability and may imply that nothing is acceptable unless it is above challenge. Gangesa does not endorse that. Such claims as that there is doubt or that the doubt is gone are factual claims that can be shown to be reasonable and reliable claims without having to meet the impossible standard that these are beyond challenge. Gangesa's position is that one's own behavior provides the sufficient ground (supported incidentally by recent studies on cognitive dissonance) to claim that the doubt is not there. The aim is not to show that the doubt is impossible but rather that it makes more sense, given what we know about one's own behavior, to say that the doubt is not there. The argument from conflict is misunderstood if it is turned into a deduction with inductive general premises as the skeptic wants. No such deduction is needed and no infinite regress of inductive general premises follows.

> Text. *Atah eva vyāghātah yadi śamkā asti na cet śamkā tatah taram. Vyāghātāvadhih āśamkā tarkah śamkāvadhih kutah iti khaṇdanakāramatam apāstam. Na hi vyāghātah śamkāśritah, kintu svakriyā eva śamkāpratibandhikā iti.* (233)

> Tran. So the following view of the author of *Khaṇdana* stands refuted: if there is conflict, there is doubt; if there is no conflict, there is doubt all the more. How can then conflict provide the limit of doubt and how can then subjunctive reasoning provide the limit of doubt? Not that conflict presupposes doubt; rather it is one's own action itself that serves as the obstruction to doubt.

This passage refers to a famous critique of induction by Sriharsa, the author of *Khaṇdanakhaṇdakhādya*. Sriharsa has turned around a well-known verse of Udayana, a great Nyāya philosopher of the eleventh century CE. The verse of Udayana is as follows: *Śamkā cet anumā asti eva na cet śamkā tatah tarām. Vyāghātavadhih āśamkā tarkah śamkāvadhih matah* (NK III.7). This means: if there is doubt, there is inference for sure; if there is no doubt, there is inference even then. Conflict is the limit of doubt; CR, too, is viewed as the limit of doubt. Udayana is here responding to the skeptic's objection that in so far as an inference is based on a general premise that itself involves inference from what is observed, there is always room for the doubt that the general premise may be false. The skeptic's conclusion is that such an inference should not be counted as a source of knowing, for it is based on a premise that is irremediably doubtful. If one tries to redress the situation by bringing in another inference or another CR with a general premise as a backup, that, in the skeptic's view, does not improve the matter, for one can still raise the same

kinds of doubts about the premises of the backup inference—and this can only result in circularity or infinite regress.

Udayana's point is that reliability of the general premise is questioned on the ground that it involves an inductive leap to unobserved cases where the possibility of a counterexample is not ruled out. Thus the doubt about the general premise is not with reference to the observed cases, for no counterexample is found in the observed cases. Rather, the doubt is with reference to the unobserved cases. But any reference to the unobserved cases is beyond the purview of perception and is possible only with the help of an inference based on a general premise. Thus the very skeptical doubt is possible only if inference based on a general premise is possible. Such doubt cannot rule out the reliability of such inference, for the former presupposes the latter. On the other hand, one may disown that there is such doubt. But then there is no challenge to inference arising from doubt that serves as an obstruction to inference. With the obstruction gone, thus, the status of inference remains secure.

Udayana claims further that conflict with one's behavior serves as the obstruction or limit to the skeptical doubt. This is similar to the point made by Gangesa who was deeply influenced by Udayana. That is, one who regularly procures fire to make smoke does so with the belief that fire produces smoke. Such a belief is an obstruction to the doubt about fire being a casual condition of smoke or not. An obstruction is that which prevents an effect from happening even when other causal conditions of the effect are available, so that the absence of the obstruction must be counted as a necessary condition of the effect. For example, even when all other causal conditions like fuel are available, a burning fire is extinguished by pouring water over it. Thus water is an obstruction to burning and absence of that kind of water is a necessary condition of burning. In the same way, the said belief serves as an obstruction to the occurrence of the said doubt and prevents it from happening.

It may be noted that water is an obstruction to burning because water has some properties that are naturally incompatible with the properties of burning. For example, burning may be said to involve a certain kind of bodily expansion that is opposed to the kind of bodily contraction that water may bring about. That is, from the Nyāya point of view, such bodily expansion and such bodily contraction are properties that are never co-located in the same thing (*samānādhikaraṇa*) at the same time. The discovery of such properties and their interrelationships are, according to the Nyāya, among the major goals of sciences like physics and provide the foundations for the laws of nature. Since such properties belong to external things like fire and water, their discovery is possible only through external observation. However, external observation is not needed for discerning the interrelationship of contents of internal states. For example, a belief in P is an obstruction to the doubt about P or not-P

because the former has some properties that are incompatible with the properties of the latter. Such properties pertain to the contents (*viṣaya*) of such a belief and such a doubt and hold at the level of contentness (*viṣayatā*). For example, the doubt about P or not-P includes among its contents the negation of P; however, both P and the negation of P do not become contents of the same patently clear belief about the same thing at the same time in the same respect. Since both a belief and a doubt are internal states, the discovery of such interrelationships at the level of contentness is done by the mind or the inner sense (*manas*) alone without having recourse to external observation.

Text. *Na vā viśeṣadarśanāt kvacit śamkanivṛttih evam syāt*. (233)

Tran. It is not also that doubt would have been sometimes removed from the observation of specific features in such a case.

Gangesa offers another objection to the skeptical position of endless regress of doubts. Doubt is sometimes removed from the observation of specific features. For example, someone may wonder if the thing in front is a man or a statue. Then he may notice a movement of a limb. Since a statue cannot move a limb but a man can, this resolves the doubt that is replaced by the belief that the thing in front is not a statue. It is a matter of common experience (*anubhava*) that doubt is sometimes removed in this way. But if there is always an unending regress of doubts, this could not happen in any case. Thus the skeptical position goes against the verdict of common experience. Here ends, it may be noted, the major refutation of skeptical doubt by way of CR. [From the Nyāya point of view, common experience is not infallible. Still, common experience cannot be set aside without firm evidence. A theory that conflicts with common experience is suspect and is open to the presumption that there is something wrong in the theory as well as the reasoning that leads to the theory; thus, the burden of proof is squarely on one who advocates such a theory.]

Text. *Na ca etādṛśatarkāvatarah bhūyodarśanam vinā iti bhūyodarśanādarah, na tu sa svataeva prayojakah*. (233)

Tran. It is also not that since such CR is not possible without multiple observation, there should be endorsement for multiple observation (as a ground for generalization), for that is not conducive (to generalization) on its own.

The CR points out that the doubt that the probans exists without the probandum conflicts with one's own action of regularly procuring the probandum to procure the probans. Such a claim about one's own action of regularly procuring the probandum to procure the probans is grounded in multiple observations. This is why multiple observations are useful for CR. Since the latter plays a use-

ful role in the justification of induction, should multiple observations too be recognized as something that is indispensable for induction? No, says Gangesa, for it has already been shown that multiple observations are neither a necessary nor a sufficient ground for induction. This is the point of the reminder that multiple observations are not conducive to induction on its own.

Text. *Ata eva tadāhitasamskārah na mānāntaram tarkasya apramātvāt, tat ca pratyakṣavyāptijñāne hetuh tadabhave api śabdānumānābhyām tadgrahāt.* (233–34)

Tran. Hence the impression left by that (multiple observations) is not a separate source of knowing, for CR is not knowledge (i.e., reliable awareness); and that is a contributing factor (only) in perceptual awareness of pervasion, for that can be grasped even without it with the help of authority or inference.

The Nyāya traditionally recognizes four different sources of knowing, viz., perception, inference, *upamāna* (learning about what an unfamiliar expression denotes with the help of an instruction about similarity or dissimilarity with something familiar) and authority. But what about the impression (*samskāra*) of multiple observations? Such impression plays a role in the justification of induction that is accepted as knowledge. Still, the impression does not fit the description of any of the four recognized sources of knowing. So why should it not be recognized as a separate source of knowing?

Gangesa replies that the impression is useful for CR. Although the latter plays a role in the justification of induction, CR is not knowledge in its own right. Since the said impression is needed for something that falls short of knowledge, the former should not be recognized as a source of knowing.

It is worth noting that something that is less than knowledge may still make a contribution to knowledge. This is an important move in the ongoing debate with the skeptic. A skeptic may hold that if the foundation fails to qualify for knowledge, anything erected on that foundation also fails to qualify for knowledge. Gangesa disagrees. He takes the position that something less than knowledge may still make a contribution to knowledge. This is consistent with the causal reliabilist standpoint to which the Nyāya subscribes. From this standpoint a variety of factors make different kinds of knowledge or reliable awareness possible. For example, many Nyāya philosophers do not recognize memory as knowledge; still there is general agreement among Nyāya philosophers that memory plays a useful role in perception, inference, *upamāna* as well as authority. Similarly, CR need not qualify for knowledge in order to play a role in the justification of induction that is accepted as knowledge.

But why does not CR qualify for knowledge? The reason is that CR starts with a supposition that is accepted to be false. For example, it is accepted that

smoke is caused by fire and is always preceded by fire. Still, one would suppose, for the sake of argument in a CR, that there is smoke without fire. Since such willful deviation from what is accepted as true is an indispensable part of CR, the latter does not qualify for knowledge. For the Nyāya reasoning does not qualify for knowledge or reliable awareness unless it is not only valid but also sound. In a sound reasoning the premises as well as the conclusion are true. The CR contains a valid deduction within it. [In a valid deduction it is possible to have a true conclusion and a false premise.] But although the conclusion is true, the reasoning contains a false premise. Hence it is not sound and falls short of knowledge.

Gangesa adds that multiple observations have a role to play only in the perceptual grasp of pervasion. For example, if one learns through perception that all smoky things are fiery, it helps as a preliminary to see a number of smoky things that are fiery. But such a preliminary role for multiple observations is not assured in all cases. One may learn also from reading a book that all smoky things are fiery. Multiple observations play no such preliminary role here.

It still remains true that for pervasion among external things, external perception is the indispensable starting point of our awareness of such pervasion. Multiple observations, though neither a necessary nor a sufficient condition, play a useful role in such external perception as well as the CR to follow upon. The above remark of Gangesa in no way disregards this.

> Text. *Nanu sahacāradarśanavyabhicāradarśanavat vyabhicāra-śamkā-viraha-anukūlatarkayoh jñānam vyabhicārisādhāraṇam iti na tatah api vyāptiniścayah iti cet.* (234)

> Tran. Objection: Just as awareness of co-presence and lack of awareness of deviation may take place with reference to a deviant mark (as well), so also lack of the fear of deviation and a supportive CR may be available for a deviant mark (as well). Hence pervasion is not known from that too.

Gangesa himself has insisted earlier that merely the awareness of co-presence and lack of awareness of deviation are not sufficient grounds for induction. For a deviant mark too is observed to be co-present with the probandum in hundreds of places and one may not happen to be aware of any counterexample in such a case. In the same way, the objector argues, one may not have any fear of deviation with reference to a deviant mark as well and one may offer supportive CR for a deviant mark as well. So how can these two rule out the fear of deviation and provide the proper grounds of induction?

The fact that Gangesa raises this objection against his own position shows how close he can get to the skeptic's own position and how sensitive Gangesa is to the legitimate concerns of the skeptic.

Text. *Na. Svarūpasatoreva tayoh vyātigrāhakatvāt. Sattarkāt vyāptipramā tadābhāsāt tadapramā viśeṣadarśanasatyatvāsatyatvābhyām puruṣajñānam iva.* (234)

Tran. Reply: No, for they are grounds of induction on their own. From a cogent CR there is a reliable induction; from a CR that appears to be so (but is not cogent) there is an unreliable induction. This is similar to the awareness of a person based on the truth or falsity of the awareness of the specific feature.

Gangesa partly reiterates a point he has made earlier in the section on the accepted view of the method of generalization but in the process also throws new light on his own position. Unlike the skeptic, Gangesa is not concerned with a possible fear of deviation but an actual fear of deviation. An actual fear of deviation is a particular state of awareness and arises only under certain conditions and does not arise if one or more of those conditions are missing. So as a matter of fact, though not as a matter of logical impossibility, there are many situations when one does not actually harbor a fear of deviation. Under such circumstances, a supportive CR could lead to an induction. Since the fear of deviation is an obstruction to induction, the lack of such fear, Gangesa points out, is on its own a causal condition of induction. Similarly, a CR is by its own nature a causal condition of induction and these two together are sufficient conditions of induction. That is, whenever these two conditions are fulfilled, an awareness of induction (unless there is some obstruction) will result as an effect. But such an induction, he hastens to add, may not always be reliable. It will be reliable if the CR is reliable and not otherwise. This is similar to the resolution of a doubt about a thing in front that could be a man or a statue. The doubt is resolved if one notices some movement of limb in the thing in front and one has the belief that the thing in front is a man. The reliability of this belief depends on the reliability of the specific information. If the specific information is reliable, the belief is reliable and not otherwise. In the case of an induction the specific information is provided by CR. If the latter is reliable, the induction is reliable and not otherwise. A CR is, of course, reliable if the claim made in the CR is reliable, viz., that assuming the negation of what is accepted does reliably lead to an undesirable consequence.

Text. *Apare tu yatra tarke vyāptyanubhavah mūlam tatra tarkāntarāpekṣā, yatra tu vyāptismaraṇam hetuh tatra na tarkāntarāpekṣā iti na anavasthā, asti ca jātamātrāṇām iṣṭāniṣṭa-sādhanatā-anumitihetu-vyāptismaraṇam, tadānīm vyāptyanubhāvakābhāvāt, tanmūlanubhavamūlā ca agre api vyāptismaraṇaparamparā iti.* (235)

Tran. Others are of the view that where the non-recollective awareness of pervasion is the basis of a CR, there is need for another CR, but where the recollection of pervasion is the basis, there is no need for another CR; hence there is no infi-

> nite regress. There is indeed recollection of pervasion as a causal condition of the inference of being beneficial or harmful made by a newborn, for the conditions of a non-recollective awareness of pervasion are missing then; however, there is a regress of recollections of pervasions as the (substitute) basis of the non-recollective awareness that is the base of that.

The skeptical objection to CR as a method of induction is that CR itself makes use of inductive premises that in their turn need other CRs, so that the door to a vicious infinite regress is opened. Gangesa has responded that CR is needed only where there is fear of deviation. But it is far from proved that there is fear of deviation in each case of induction. If and when in a given case there is no actual fear of deviation, CR is not needed and so the regress stops. Further, in some cases an actual fear of deviation is obstructed, Gangesa claims, by one's own action of regularly procuring the pervader to produce the pervaded. For example, as Gangesa notes, one who eats regularly to get nourishment does not actually doubt that eating is necessary for nourishment. The threat of regress is unsubstantiated in such cases.

Now Gangesa reports an older view (to which he does not subscribe) that seeks to explain the infinite regress in a different way. In this older view there may be need for another CR only when the induction used as a premise is grasped in a non-recollective way and is being grasped for the first time. As a fresh item of experience such an induction may be in need of further corroboration like any other new experience. But this is not necessarily so when the induction used as a premise is recollected (i.e., is familiar and already checked out as reliable). Thus the regress is unjustified.

The likely objection to this view is that an induction that is familiar now was unfamiliar to start with and so is eventually in need of further corroboration; this shows that the regress cannot be avoided in this way.

But in reply these older thinkers point to a situation where the regress is already accepted on different grounds. This is the situation of a newborn engaging in a voluntary action for the first time after birth, such as suckling the mother's breast. Such actions are labeled as instinctive by modern thinkers; but in the Hindu-Buddhist-Jain view such actions are voluntary and caused by the awareness that the result of the action is beneficial. For example, the newborn suckles for the first time after birth because it is hungry and knows that suckling satisfies hunger. This is an induction that the newborn has no opportunity of learning in the present life. So it must be a recollection from a previous life. But the same situation arises in the previous life when that newborn suckles for the first time in that life; hence an infinite regress of previous lives should be accepted to account for that. [This is a sophisticated philosophical position the pros and cons of which cannot be

discussed in a short space.] Since this already accepted regress suffices to account for the justification of induction as well, no harm is done. Thus in this older view the regress is eventually acknowledged to be there but is reduced to a regress that supervenes on a regress already accepted on other grounds.

Text. *Yat tu anādisiddhakāryakāraṇabhāvavirodhādimūlah kecit tarkah iti. Tat na. Tatra pramāṇānuyoge anumāne eva paryavasānāt. Na ca vyāptigrahānyathānupapattyā eva tarkasya anādisiddhavyāptikatvajñānam iti vācyam. Anupapatteh api anumānatvāt.* (236)

Tran. Some take the position that the basis of CR is the opposition and so on between an effect and a causal condition that are known to be beginningless. That is not so: if the evidence for that is scrutinized, it is reduced to inference itself. It should not also be said that since the grasp of pervasion is not explicable otherwise, the beginningless connection between CR and pervasion is known in that way (i.e., by way of being not explicable otherwise), for not being explicable (otherwise) too is inference.

This is another response to the skeptical objection that the justification of induction through CR opens the door of an infinite regress. Some say that the causal regress is already known to be beginningless. So the regress from the introduction of CR is not a matter of concern. This is similar to the accepted regress in the case of, say, a tree and a seed, for it is impossible to say which comes first—a tree or a seed. In the same way, induction is dependent on CR and the latter too is dependent on the former and thus regress is inevitable. This is no more puzzling than that there can be no tree without a seed and no seed without a tree, so that regress is inevitable and in order.

Gangesa rejects this view on the ground that the claim about such beginningless dependence between induction on the one hand and CR on the other can be justified only through inference that makes use of an inductive premise. This invites the charge of circularity.

One could dispute that the said claim could be justified only through an inference based on an inductive premise. One could argue that the claim could be justified differently, by way of what is called "not being explicable otherwise" (*anupapatti*, *arthāpatti*).

It would take a lot of space to explain what is at stake here. It would have to suffice to note that Gangesa rejects this by saying that *anupapatti* or *arthāpatti* too is reducible to inference making use of an inductive premise. Hence the charge of circularity still sticks from his viewpoint.

Text. *Anye tu vipakṣabādhakatarkāt anaupādhikatvagrahah eva tadadhīnah vyāptigrahah iti.* (237)

Tran. Others hold that what follows from CR that eliminates the supposition that the probans exists somewhere without the probandum is only that (the connection between the probans and the probandum) is not dependent on a third factor; that provides the basis for induction.

This is the view of some Nyāya philosophers who hold that induction is not directly supported by CR. Rather, CR eliminates the supposition that the probans exists in a place where the probandum is absent and shows that the connection between the probans and the probandum is not dependent on a third factor (*anaupādhika*). This provides the basis of reliability of induction.

Text. *Tat api na, tarkasya apramāṇatvāt*. (237)

Tran. That is not accepted, for CR is not a source of knowing.

Gangesa does not agree that it is necessary to determine the reliability of a state of awareness in each case. So no justification of each and every induction is needed. The justification can be given when an induction is challenged and for that CR is useful. Thus CR is needed for knowing (*jñapti*) that an induction is reliable but not for an induction being (*utpatti*) reliable. Accordingly, Gangesa is opposed to a view that makes CR even a remotely necessary condition for induction. To make CR even a remotely necessary condition would reinstate the charge of infinite regress or circularity.

Further, CR is not a source of knowing, for it contains a premise that is known to negate what is accepted and, accordingly, the relevant deduction is valid but not sound. So a skeptic would not be satisfied even if CR were to be made a necessary condition, directly or remotely.

Text. *Vyabhicārādiśamkānirāsadvārā pratyakṣādisahakāri sah iti cet? Na. Anavasthābhayena tarkam vinā vyābhātāt yatra śamkāvirahah tatra vyāptigrahe tarkasya vyabhicārāt*. (237–38)

Tran. Is it (CR) an auxiliary to perception and so on (for the grasp of pervasion) by way of blocking the fear of deviation and so on? No. Out of concern for the threat of infinite regress (we hold that) pervasion is grasped without CR where there is no apprehension (of deviation); thus grasping pervasion deviates from CR (i.e., pervasion may be grasped without CR).

After objecting to recognizing CR as a remote (but independent: *svatantra*) causal condition of induction, Gangesa now objects to recognizing CR as an auxiliary causal condition of induction. If CR is recognized as a causal condition, auxiliary, or remote or of any other kind, of induction, the threat of infinite regress would be real. Hence Gangesa's own view is that CR is not necessary for induction where there is no fear of deviation due to conflict with one's

own regular activity of procuring the pervader to produce the pervaded. Such an induction may be reliable without being known to be reliable. For an adequate response to the skeptic a distinction must be drawn between being (*utpatti*) reliable and being known (*jñapti*) to be reliable. CR plays a role for the latter but not for the former. According to Gangesa, truth or reliability (*prāmāṇya, yāthārthya*) consists in, roughly speaking, correspondence (*tadvati tatprakārakatva*). So an induction is true or reliable if what is taken to be pervaded is as a matter of fact pervaded by what is taken to be the pervader. For example, that smoke is pervaded by fire is true or reliable if as a matter of fact smoke is pervaded by fire. But the test of truth or reliability is different. So far as induction is concerned, CR plays a role in testing the truth or reliability of induction.

> Text. *Yat tu yogyānām upādhīnām yogyānupalabdhyā abhāvagrahah ayogyānām tu sādhyāvyāpakatva-sādhanavyāpakatvasādhanāt abhāvagrahah iti anaupādhikatvam sugraham iti. Tat tuccham. Anumānena tatsādhane anavasthānāt pramāṇantarasya abhāvāt*. (238–39)

> Tran. (It may be held that) the lack of perceptible (*yogya*) adjuncts (*upadhi*) is known through nonperception of what is perceptible (*yogya-anupalabdhi*) and the lack of imperceptible adjuncts is known by way of showing that (the thing thought to be an adjunct) does not pervade the probandum or pervades the probans and, accordingly, that the lack of adjuncts is definitively knowable. But that is without substance. If that is shown with the help of inference, there is infinite regress; (at the same time) no other source of knowing would suffice.

This view differs from the immediately above views in the respect that it does not include CR as a requisite condition for induction (either in a remote capacity or in an auxiliary capacity or in some other capacity), for the inclusion of CR invites the charge of an infinite regress. In this view, the key step for knowing that an induction is reliable is to know that it is free from adjuncts. This can be achieved by eliminating perceptible (putative) adjuncts on the ground that they are not perceived and imperceptible (putative) adjuncts by showing through inferences that they do not pervade the probandum or that they pervade the probans. [An adjunct pervades the probandum but not the probans.]

Gangesa rejects this on the ground that this view is still open to the charge of infinite regress. The said inferences would have to rely on inductive premises that would be in need of further justification and so on to infinity. The common assumption of the above views that Gangesa rejects is that an induction must in each case be known or shown to be reliable. As long as this assumption remains, no matter what is tried, the skeptic wins.

Text. *Ye ca anukūlatarkam vinā eva sahacāradidarśanamātreṇa vyāptigraham vadanti, teṣām pakṣetaratvasya sādhyavyāpakatvagrahe anumānamātram ucchidyeta*. (240–41)

Tran. Some say that pervasion is grasped from observation of co-presence and so forth alone without a supportive CR. But for them "being other than the inferential subject" would pervade the probandum and then all inferring would be eliminated.

In the Mīmāmsā view no supportive CR is needed for induction, for observation of co-presence and the like suffice for it. Gangesa objects to this view. "Being other than the inferential subject" (bois) is a feature that is absent in the subject, for the subject is not other than itself. However, the mark is present in the subject in a sound inference. Thus it follows that bois does not pervade the mark. But the probandum is also co-located with bois in a positive instance, for the positive instance, too, is other than the inferential subject. If the observation of co-presence and the like are sufficient grounds of induction and a supportive CR is uncalled for, bois may be said to pervade the probandum. Then bois fulfills the definition of an adjunct that is going to crop up in each and every inference that makes use of *vyāpti* (the pervasion of the probans by the probandum) and *pakṣadharmatā* (the possession of the probans by the subject) as premises and the possession of the probandum by the subject as the conclusion and disqualify all of them from being sources of knowing.

The difference between the Mīmāmsā view and Gangesa's view is that in the former view a supportive CR is never necessary for induction while in the latter view a supportive CR is necessary in some cases, viz., where reliability of an induction is in doubt and needs to be clarified.

Text. *Anumānamātrocchedakatvāt eva pakṣetarah na upādhih iti cet*. (241)

Tran. Objection: Since all inferences would be eliminated, for that very reason "being other than the inferential subject" is not an adjunct.

The Mīmāmsā refuses to recognize bois as an adjunct. If it were an adjunct, all inferences of a certain kind would be eliminated. But to show that something is an adjunct, one has to make use of the same kind of inference. Something that undermines the very foundation that it needs for its own standing is philosophically unacceptable.

Text. *Bhrāntah asi, na hi vayam upādhitvena tasya doṣatvam ācakṣmahe, sādhyavyāpakatvena tadvyatirekāt pakṣe sādhyavyāvarttakatayā vyāpakavyatireke vyāpyavyatirekasya vajralepatvāt ca*. (241)

Tran. You are wrong. We do not hold that it is a fault in so far as it is an adjunct. Since it pervades the probandum, from its absence in the subject follows the absence of the probandum (in the inferential subject), for absence of the pervader implies (literally: attaches like the [divine] thunder bolt [that never misses]) absence of the pervaded.

Gangesa replies that bois need not be classified as an adjunct. That is, it is unnecessary to claim that it pervades the probandum and does not pervade the probans. Whether it pervades the probans or not may be left undetermined. All that is needed is to claim that it pervades the probandum. Then the absence of the probandum in the inferential subject would follow from absence of "being other than" in the subject. This faults the inference that the probandum is present in the subject.

Text. *Api ca karavahnisamyogah śaktyatiriktātīndriyadharmasamavāyi janakatvat ityatra aprayojakatvāt na sādhakam tatra vyāptasya pakṣadharmatve kim aprayojakam nāma tasmāt vipakṣabādhakatarkābhāvāt na tatra vyāptigraha iti aprayojakatvam.*

Tran. Further, (take) the (inference) that there is inherence of an additional imperceptible thing or power (or an imperceptible thing over and above power) in the contact between a hand and fire on the ground that (the contact between a hand and fire) is a causal condition. In this case (being a causal condition) is not a probans because of lack of a supportive CR. There, since the pervaded belongs to the inferential subject, what is without a supportive CR? Accordingly, since no CR that counters the presence of the mark where the probandum is absent is available, there is no determination of the pervasion (as reliable); thus there is lack of supportive CR.

Gangesa cites another case of a faulty inference (from the Nyāya viewpoint) where the lack of CR plays a useful role in showing that the inference is faulty. The crucial inductive premise needed here is that all causal conditions are possessed of an imperceptible power (or possessed of an imperceptible thing over and above power depending on how the text is read). This premise, in the Nyāya view, is not supported by CR. So it is not reliable. This also makes the inference unreliable. This illustrates how CR may play an important role in the justification of induction.

NOTE

1. Festinger, L., *A Theory of Cognitive Dissonance*, Stanford University Press, Stanford, Calif., 1957; Harmon-Jones, E., and Mills, J., *Cognitive Dissonance: Progress on a Pivotal Theory of Social Psychology*, American Psychological Association, Washington D.C., 1999.

5

Universal-Based Extraordinary Perception: *Sāmānyalakṣaṇapratyakṣa*

Text. *Vyāptigrahah ca sāmānyalakṣaṇapratyāsattyā sakaladhūmadiviṣayakah, katham anyathā parvatīyadhūme vyāptyagrahe tasmāt anumitih*. (253–55)

Tran. Some say that pervasion is grasped through the universal-based sensory connection and has all smokes and so on as the content; how otherwise, when the smoke in the hill is not known to be pervaded (by fire), can there be inference (of fire in the hill) from that?

In Gangesa's view, although pervasion is grasped in other ways, pervasion is most importantly grasped through perception. The reason for this may be explained as follows. Inductive premises play a large role in inferences based on them and one may ask: how are such premises grasped? By way of an answer one may say that such premises are grasped through other inferences and so on that make use of the indirect (*parokṣa*) sources of knowing. Such an answer can work only up to a point. For the premises or the sources of such indirect ways of knowing may also be investigated. If then we rely only on indirect knowing, the threat of infinite regress or of circularity becomes ominous. To avoid infinite regress or circularity a direct way of grasping the inductive premises is necessary. The direct way comes from perception.

This view has some similarity with the view of Aristotle regarding the role of *nous* in induction. Aristotle faced a similar problem because universal premises are essential in categorical syllogisms and one may ask: how are such premises known? If the universal premises could be known only through categorical syllogisms, that would invite the charge of either circularity or infinite regress: hence the recourse to the doctrine of *nous*. However, the nature of

nous is a matter of great controversy among Aristotelian scholars and we cannot pursue it any further here.

So far as Gangesa is concerned a distinction must be drawn between how inductions are justified and how inductions are grasped. Gangesa has addressed the former problem in the chapters on the methods of generalization and the chapter on counterfactual reasoning. The latter problem has also been addressed in those same chapters but only in part. Gangesa's views on the latter problem in those chapters may be summarized as follows. Inductions are grasped through (1) observation of co-presence so long as (2) a counterexample is not observed and so long as (3) one is not doubtful about the presence of an unobserved counterexample. Both observation of an actual counterexample and the fear that there is an unobserved counterexample are obstructions (*pratibandhaka*) to induction. Hence not only (1) but also (2) and (3) are recognized as elements of the method of generalization. [Obstructions do not make something impossible but do make something less likely, for the thing would not take place if there is an obstruction unless there is also a stimulant (*uttejaka*) to overcome the obstruction.] In the present chapter Gangesa proceeds to throw more light on the matter by theorizing about an extraordinary kind of perception that is based on universals. Although such perception is extraordinary (in a sense to be explained below), there is nothing mysterious or vague about it. The recognition of this kind of extraordinary perception does not also undermine in any way the Nyāya commitment to realism.

As noted above, inductive premises should not be grasped only through indirect sources of knowing such as inference, for then there is threat of infinite regress or circularity. So inductive premises should sometimes be grasped directly or perceptually, for perception is the only source of direct awareness in the Nyāya system. But how is perception of all things of a certain kind possible? All things of a certain kind include past and future members of that class. How can there be a sensory connection with things that are past or future? If not, how can there be perception without sensory connection?

Gangesa initially begins the case for a kind of extraordinary perception by presenting it as a view that is not necessarily his own. That is, he starts by presenting it as the view of someone without identifying the thinker. According to the unidentified thinker, even the stock inference of fire in a hill from the perception of smoke there cannot be explained without admitting the extraordinary perception. Such inference is based on the awareness that smoke is pervaded by fire. But the smoke in the hill has not been observed to be together with fire before. What has been observed before is that some particular smokes in kitchens, say, are together with fire. Thus the earlier observation falls short of providing the warrant for the said inference. That warrant can come from awareness that all smokes, including the smoke in the hill, are

pervaded by fire. But the scope of this awareness subsuming all smokes—past, present and future—is clearly beyond that of the earlier observation. In fact, none of the ordinarily accepted ways of sensory connection suffice for the perception of all things of a kind including past and future things. [There are six "ordinary" ways of sensory connection accepted in the Nyāya system. Each one of them is ruled out here.] So the said thinker introduces a kind of extraordinary sensory connection that makes such perception possible. This is known as universal-based sensory connection (*sāmānya-lakṣaṇā-pratyāsatti*); this makes possible what is known as universal-based perception.

One key to this view is the Nyāya theory of universals. Universals are eternal and independent common characters that inhere in all members of a class. Without universals, the Nyāya claims, no proper accounting can be given for natural classes. Lions and tigers are two different species of animals. No lions are tigers and no tigers are lions. But what makes all lions (past, present and future) different from all tigers (past, present and future)? One reasonable answer is that all lions share a common feature that is missing in all tigers. This common character also makes all lions the same in one respect. Unless all lions are the same in some respect, why should all of them be in the same natural class? That is, unless all lions actually share something objective in common, why should the class of lions be a natural class and not a conventional class?

Again, without universals no proper account can be given, in the Nyāya view, for laws of nature such as that heat expands bodies. Unless all heat shares some objective common feature, how can it be that all heat expands bodies? In other words, unless all heat shares some objective common feature, it can very well be there is some heat that does not expand bodies.

But the very fact that we are dealing with natural classes makes such common characters eternal and independent of all particulars. No time limit can be drawn for the existence of any natural class. Even if all members of a natural class become extinct, there remains the possibility that the class may reappear in some distant time or distant place. Hence such common characters should be eternal. They should also be independent of the particulars. Otherwise they could not be the same in all particulars. Particulars come and go and change. But the common character that is the objective foundation of a natural class should not change—such are some of the main Nyāya arguments for universals.

Since universals are already included in the Nyāya system, their services may be utilized in the present context. What is needed is something that can provide the connection between a sense organ and all members of a class so that all those members (including past and future as well as distant ones) could be perceived in some sense. Universals can fill that role. For the Nyāya

universals are primarily grasped through perception. [This is quite different from the rationalist view that universals are grasped only by the reason.] So a sensory connection between a sense organ and a universal is already admitted in the Nyāya system. It is also admitted that universals inhere in all members of the class—past, present and future. Thus universals are eminently suitable for providing a sensory connection between a sense organ and all members of a class. Hence it is proposed that our perceptual grasp of inductions is possible with the help of universals providing the basis of the sensory connection.

One reason for this view, as already said, is that otherwise the very role of a probans in a probans-centered inference would be in jeopardy. Suppose one infers fire in a hill after observing smoke there. This presupposes that smoke is pervaded by fire. But all that has been observed in the ordinary way before is that some smokes are together with fire. The particular smoke that is being observed now is not one of them. Still, one needs to know that all smoke including that particular smoke is pervaded by fire. This knowledge could come from some indirect source some of the time but not all of the time, for then there would be an infinite regress or circularity. So this knowledge should ultimately come from a direct source—that is, perception. But no ordinary perception is possible, for no ordinary sensory connection with past and future as well as distant things is possible. So the said knowledge should come from an extraordinary perception making use of universals as the most suitable means for the extraordinary sensory connection.

> Text. *Sā ca indriya-sambaddha-viśeṣaṇatā atiriktaiva vā, tadviśeṣyaka-pratyakṣe tadindriya-sannikarṣasya hetutvena anāgatadau samyogāderabhāvaditi vadanti.* (255–71)

> Tran. That is either the qualifier of that with which there is (ordinary) sensory connection or is something additional. Indeed, sensory connection with that which is the qualificand of a perception is a causal condition of perception of that, but no contact and so on with what is future and so on is possible.

Gangesa mentions two different versions of the role that a universal plays in this kind of extraordinary perception. In the first version the universal is the qualifier of that with which there is ordinary sensory connection. [RS suggests that the word *viśeṣaṇata* in the text should be construed as *viśeṣaṇa*. Alternatively, the relevant text should be construed as a Vahuvrihi compound. In either construal the universal itself provides and is the sensory connection (RS in JD 334).] For example, when one has ordinary sensory connection with a smoke, smokeness is the qualifier in the ordinary perception of that smoke. Such a universal that serves as the qualifier in an ordinary perception can be the extraordinary sensory connection in this context. This implies that unless

the universal is featured as a qualifier in an ordinary perception, the universal cannot provide the extraordinary sensory connection. This restriction is necessary; otherwise, even someone whose eyes are closed and merely has a remembrance of the universal could have an extraordinary visual perception of all instances of that universal, as RM and DR point out [*nimīlita-nayanasyāpi smṛta-sāmānya-pratyāsattyā cākṣuṣajñānam syāt* (RM 232)]. In other words, as RS emphasizes, in order to have such an extraordinary perception through an external sense organ, the latter should be in ordinary sensory connection with the qualificand and the awareness should arise from only that particular sense organ [*vahirindriyasya laukikah sambandho jñānasya tadindriya-janyatvamca niyāmakam* (RS in JD 335)]. However, as JD argues, that the universal is a qualifier in an ordinary perception should not be interpreted to mean that the universal actually belongs to that with which there is ordinary sensory connection. Suppose that a vapor is mistakenly perceived as smoke. Here smokeness is the qualifier, although smokeness does not belong to the vapor. Still, the extraordinary perception of all smokes is possible in this case. Thus as long as an external organ is in ordinary sensory connection with something and a universal is featured as the qualifier in that perception, the extraordinary perception of all instances of that universal is possible [*Indriya-sambaddha-viśeṣaṇatvam yadi indriya-sambaddha-vṛttitvam tadā dhūmatvasya indriya-sambaddha-vāspādi-dharmatvābhāvāt tādrūpyeṇa vāspāgrahāt sakala-dhūma-pratyakṣyam na syāt* (JD 334–35)].

When a universal serves as the extraordinary sensory connection, is the latter one of the six accepted kinds of sensory connections in the Nyāya system? The answer is "yes," according to MN. According to MN, such an extraordinary sensory connection belongs to the kind called *viśeṣaṇatā*. The latter is a kind of self-relation (*svarūpa-sambandha*). [A self-relation is a relation that is reducible to either relata.] This is similar to the kind of sensory connection that makes the perception of negative entities possible [*Sa ca abhāvādi-grāhaka-cākṣuh-samyukta-viśeṣanatādivat viśeṣaṇatā-pratyāsatti-antargatā eva* (MN 254)]. That is, both the sensory connection involved in the perception of negative entities and the extraordinary connection provided by a universal are classifiable as cases of *viśeṣaṇatā*. Still, as GD remarks (GD 773), the precise nature of *viśeṣaṇatā* may be different in the two cases. In the perception of negative entities the connection may arguably be reducible to the substratum (*anuyogin*). But when a universal serves as the extraordinary sensory connection, the *viśeṣaṇatā* may be reducible to the superstratum (*pratiyogin*).

In the second version, however, the extraordinary sensory connection is something additional. That is, such connection is not included in one of the six recognized kinds of sensory connection. In the second version, then, it is

implied that the sixfold classification of sensory connections applies only to ordinary sensory connections and does not apply to the extraordinary ones [*Śodā pariganantu laukika-abhiprāyeṇa*, MN 259]. This additional type may mean, as RS suggests (RS in JD 335), the awareness of the universal or the common feature. That is, not the universal or the common feature itself but its awareness serves as the sensory connection. One reason for this second version is the following. The word *sāmānya* literally means a common feature. A common feature may be a universal (*jāti*) that is eternal and independent of the particulars. But a common feature may also be something non-eternal that may cease to exist before such extraordinary perception takes place. Then that common feature that is presently nonexistent cannot be the sensory connection. But one may still be aware of that nonexistent common feature and that awareness can then provide the extraordinary sensory connection. That is, awareness of a feature common to all members of a given collection is already connected to a sense organ, for the awareness is connected to the inner sense (*manas*) that is needed in the Nyāya view for any awareness and the sense organ is connected to the inner sense when any perception takes place. Further, the awareness is also cognitively related to all members of the collection the common feature of whom is the content of the awareness. With the help of such relationship that is already admitted, an external sense organ may produce an extraordinary external perception of all members of the collection if the common feature concerned is something external. Such awareness is perceptual, for it is direct awareness. It is not dependent on a mark (*liñga*), so it is not inferential. The requisite conditions for other kinds of indirect awareness recognized in the Nyāya system are not also available here.

> Text. *Tat apare na manyante. Tathāhi dhūmatvāvacchinna vyāptih sannikṛṣṭadhūmaviṣaye dhūmatvena pratyakṣeṇa jñāyate, tatah smṛtā sā tṛtīyaliñgaparāmarśe pakṣaniṣṭhadhūmavṛttitayā jñāyate, tatah anumitih*. (271)

> Tran. Others (the Mimamsakas) do not agree to that. Thus pervasion as specified by smokeness is grasped perceptually as there is sensory connection with a smoke together with smokeness; then that is recollected and grasped as a feature of the smoke that belongs to the subject on the occasion of the third consideration of the probans (viz., the judgment that something that is pervaded by the probandum belongs to the subject); then inference takes place.

Gangesa reports the views of Mīmāmsā philosophers who reject universal-based extraordinary perception. Many Nyāya philosophers accept the latter. The Mīmāmsā philosophers, however, offer an account of the inferential process that avoids the admission of this kind of extraordinary perception. In the Mīmāmsā view too the pervasion of all smokes by fire is grasped perceptually.

However, it is grasped as there is ordinary sensory connection with a given smoke and also smokeness that belongs to the given smoke. That is, when one sees that smoke with that fire, one also sees that the particular features of that smoke are not relevant for its togetherness with fire; rather, all that is relevant is that it is something that is possessed of smokeness which is a feature that it shares with all other smokes and, accordingly, that all smokes are pervaded by fire. This awareness is perceptual, for it is direct. Further, it is not probans-centered and hence not inferential. Thus the Mīmāmsā disagrees with Gangesa and claims that the pervasion of all smokes including past and future smokes can be grasped by ordinary perception. The universal does play a role in such perception, but it is an ordinary role. The ordinary role suffices to give rise to the perception of all smokes, for the information is confined to each smoke being merely an instance of the universal smokeness. The perception of smokeness involves its perception as the common feature of all smokes and thus perception of all smokes as well. MN says: when there is ordinary sensory connection with the smoke belonging to the subject and the smoke is cognized as a feature of the subject, pervasion too is grasped as a feature of that smoke [*Laukika-sannikarṣa-maryādayā pakṣa-viśeṣaṇatvena bhāsamānasya pakṣa-niṣṭha-dhūmasya viśeṣaṇatayā bhāsata ityarthah*, MN 273]. The pervasion has already been perceived in the kitchen, say, when the smoke there is perceived together with the fire there. Subsequently, the pervasion is remembered and perceived in the ordinary way as a feature of the smoke in the hill, say, that is the subject of the inference as there is the so-called third consideration of the probans or the judgment that something that is pervaded by the probandum belongs to the subject. (Many Nyāya philosophers regard this judgment as a necessary step in this kind of inference.) This is followed by the inference.

Text. *Tadanabhyupagame api sannikṛṣṭadhūmaviṣaye dhūmatvena dhūmo vahnivyāpya ityanubhavah tathaiva vyāptismaraṇam, tato dhuūmavān ayamiti vyāptismṛtiprakāreṇa dhūmatvena pakṣavṛttidhūmajñānāt anumitih. Vyāptyanu bhavatatsmaraṇapakṣadharmatājñānānām ekaprakārakatvena anumitihetutvāt.* (271–74)

Tran. Even if that (the third consideration of the probans) is not admitted (as a needed step in an inference), there is the awareness, with reference to the smoke with which there is (ordinary) sensory connection; that smoke as specified by smokeness is pervaded by fire; the remembrance of the pervasion is also thus; then there is the awareness that this (the subject) is possessed of smoke which is specified by smokeness that is also the qualifier in the remembrance of the pervasion; then there is the inference. Indeed, perception of pervasion, remembrance of that and awareness of belonging to the subject serve as grounds of inference in so far as the same qualifier is featured in them.

One may not agree, as Mimamsakas do not, that the so-called third consideration of the probans is a necessary step in a probans-centered inference. One may still reject the extraordinary sensory connection. In this view, after one has ordinary sensory connection with a particular smoke, one perceives that to be pervaded by fire in so far as that smoke is possessed of smokeness. Then the pervasion is remembered in the same way—that is, one remembers smoke to be pervaded by fire in so far as the former is possessed of smokeness. Then there is the awareness that this (say, the hill) possesses smoke that is possessed of smokeness that is also the qualifier of the remembrance of the pervasion; and then there is the inference. This avoids admitting that the judgment that something pervaded by the probandum belongs to the subject is necessary in each and every such inference. The Mimamsakas are not objecting to that the said inference may follow the said judgment. On the contrary, the Mimamsakas admit that the said judgment is a sufficient ground for the said inference. Nevertheless, they object to regarding the said judgment as a needed step for the said inference. What is necessary instead is that the property that is the qualifier in the perception and the remembrance of the pervasion is also the qualifier in the awareness that the probans belongs to the subject. This latter condition is fulfilled in the present case. Smokeness is the qualifier in the perception and remembrance of the pervasion that all smokes in so far as they are specified by smokeness are accompanied by fire. Smokeness is also the qualifier in the awareness that smoke as specified by smokeness belongs to the subject.

Needless to say, the mention of smokeness is meant to be only illustrative; smokeness here represents any property that happens to be the specifier of probansness. MN has pointed out this generalized version: "having the same qualifier" means that the character that serves as the qualifier of the qualificand of the awareness of pervasion is also the qualifier of the awareness that the probans belongs to the subject ["*Ekaprakārakatvena*" *iti yaddharma-avacchinna-viśeṣyatāka-vyāptijñānam taddharma-prakāreṇa hetoh pakṣa-dharmatā-jñānasyaiva anumiti-hetutvādityarthah*, MN 274].

It may be noted that "having the same qualifier" (*eka-prakārakatva*) should not be interpreted, in the Mīmāmsā view, as "having the same object" (*samāna-viṣayakatva*). Inference does not take place when the relevant judgments are about the same thing but do not have exactly the same qualifiers, as DR argues [*Satyapi samāna-viṣayatve bhinna-prakāraka-vyāpti-pakṣa-dharmatā-jñānābhyām anumityanubhavena*, 233].

This view should be preferred, the Mimamsakas claim, because it is more economical than the Nyāya view. The necessary steps for the inference in the Mīmāmsā view are (1) that smoke (or the probans) as specified by smokeness (or probansness) is pervaded by fire (or the probandum) and (2) that smoke

(or the probans) as specified by smokeness (or probansness) belongs to the hill (the subject). These two steps suffice as grounds for the inference that fire (or the probandum) belongs to the hill (or the subject). So why bring in the additional step that what is pervaded by the probandum belongs to the subject? Further, the said two steps are also needed as grounds for the said additional step. So even those who argue for the said additional step should acknowledge that the said two steps are needed as premises. If the said two steps suffice as grounds of the inference, it is superfluous to bring in the additional step as a necessary condition (although the additional step may precede and provide the sufficient ground of inference in some cases).

Now for the said two steps no extraordinary sensory connection is needed. The perception that smoke in so far as it is specified by smokeness is accompanied (or pervaded) by fire and the perception that smoke in so far as it is specified by smokeness belongs to the hill can be fully explained by the recognized ordinary sensory connections themselves.

RS remarks that for the Mīmāmsā view to work pervasion should be construed as unitary (i.e., the same pervasion should belong to all smokes or all members of the class of objects that is the probans). Such an account with reference to the stock example of smoke and fire can be given as follows: pervasion of smoke by fire is reducible to smokeness that belongs to that which is co-located with fire that is not the negatum of any absolute absence that is co-located with smoke [*Dhūma-samānādhikaraṇa-atyanta-abhāva-apritiyogi-vahni-samānādhikaraṇa-vṛtti-dhūmatvam*, RS in JD 346]. If pervasion is unitary, it can be perceived in the smoke in the kitchen and then cognized after the perception of the smoke in the hill as the same thing that belongs to the smoke in the hill as well. This can then give rise to the inference of fire in the hill. However, as JD says, if pervasion is construed as co-location, it may be taken to be different in each smoke (or each probans) [*Vyāpternānātva iti sāmānadhikaraṇyasvarūpatayā ityādih*, JD 347]. But then, since there is no sensory connection with the fire in the hill, the co-location with the latter is not cognized, or if co-location with the fire that is elsewhere were to be attributed there, there would be error [*Vyāpti-nānātve tu parvatīya-vahnerasannikarṣe tat-sāmānādhikaraṇya-graha-ayogah, anyadīya-vahni-sāmānadhikaraṇysya tatra bhānāñgīkāre bhramatva-āpatti*, RS in JD 347]. Then there is difficulty in accounting for the inference of the fire in the hill.

Text. *Gavādi-padeṣvapi śaktyanubhava-tatsmaraṇa-vākyārthānubhavānām ekaprakārakatvena hetu-hetumadbhāva ityapūrve vakṣyate, tatra yogyatādi-balādapūrva-vyakti-lābhah anumāne tu pakṣa-dharmatā-balāt dhūmo vahni-vyāpya ityanubhavo na tu sarvo dhūmo vahnivyāpya iti yena sarvabhānārtham tatsvīkārah*. (274–75)

Tran. It will be discussed in the chapter on *apūrva* that the natures of being the probans (or the causal condition: *hetu*) and being possessed of the probans (or having the causal condition: *hetumat*) that there are in awareness of reference, remembrance of that and awareness of the meaning of a sentence with reference to terms like "cow" and so on are also based on having the same qualifier. There the reference to a new individual is based on fitness (*yogyatā*) and so on; but in an inference (awareness of a new individual) is based on that (the probans) belongs to the inferential subject. Again, the perception is that smoke is pervaded by fire and not that all smokes are pervaded by fire, so that that (= ubesc: universal-based extraordinary sensory connection) is to be admitted for an explanation of the awareness of the totality.

An objection to the Mīmāmsā view and a reply that involves an excursion into the philosophy of language are cited here. However, Gangesa puts off the discussion until a later chapter. The objector draws attention to the following case (if the words *hetu* and *hetumat* are taken to stand for the probans and possessed of the probans respectively): suppose that a currently perceived individual cow specified by cowness is the inferential subject; being the object of linguistic usage is the probans and being the referent of the term "cow" is the probandum. Now suppose that ubesc is not admitted. Then, since there is no sensory connection with another individual cow and consequently no memory impression of that cow, the latter could not be known to be the referent of the word "cow." But now suppose that ubesc is admitted. Then all individual cows can be perceived in the extraordinary way with the help of cowness as the sensory connection; this can then produce the impression of all individual cows in so far as they are instances of cowness; then another individual cow too could be known to be the referent of the term "cow" in so far as it is an instance of cowness. By way of reply it is pointed out that the Mīmāmsā subscribes to *jāti-śakti-vāda*, or the theory that universals are the referents of terms. Accordingly, since in the Mīmāmsā view cowness is the referent of the word "cow," the present individual cow with which there is sensory connection is known to be a referent only indirectly; another cow in which cowness is present can also then be known to be the referent of the term "cow" indirectly although such awareness would be linguistic (*śabda*) and not a case of inference. GD elaborates that in linguistic awareness the awareness of reference and so on become causal conditions in so far as they are about the same thing (*samāna-viṣayakatvena*) and not in so far as they have the same qualifier (*samāna-prakāratāmātreṇa*). The latter condition holds for inference but not for linguistic awareness. Accordingly, from the Mīmāmsā point of view there is no bar to all cows and so on being known through linguistic awareness as the referents of the term "cow" and so on and that includes new individuals as well [*Śābda-buddhau śakti-jñānādīnām samāna-viṣayakatvena*

upayogitve apyanumitau samāna-prakāratā-mṇtreṇa parāmarśasya hetutayā . . . anupasthitānāmapi sakala-gavādi-vyaktīnām bhāna-sambhavāt tata eva apūrva-vyaktīnām . . . bhāna-sambhavāt, GD 794]. The above argument offered by some Nyāya philosophers for the admission of ubesc then fails.

The words *hetu* and *hetumat* in Gangesa's text may also be taken to stand for the causal condition and having the causal condition (i.e., being the effect) respectively. Gangesa also says there, contrary to the position of GD immediately above, that the cause-effect relation between the awareness of reference and the awareness of sentential meaning holds by virtue of having the same qualifier. This may be explained by reading the text literally as follows: for terms like "cow," cowness is the qualifier in the awareness of reference as well as its remembrance; the sentential meaning that is grasped as a result is that of being possessed of cowness. Thus in cases of linguistic awareness too the awareness of reference and the awareness of sentential meaning may be shown to be related as the causal condition and the effect by virtue of having the same qualifier. Thus, in the Mīmāmsā view, universals alone are the referents (*śakya*) of words (*pada*). For words like "cow," the awareness of reference may be analyzed as that kind of awareness in which words like "cow" are the qualificands (*go-padādi-viśeṣyaka*) and universals like cowness are the qualifiers (*gotvādi-jāti-prakāraka*). Since individual cows and so on are instances of universals like cowness, the said kind of awareness of reference serves as a causal condition of the remembrance and the linguistic awareness of individual cows and so on in which too cowness and so on are the qualifiers. Gangesa adds, on behalf of Mīmāmsā, that so far as a new individual cow and so on are concerned, they are grasped in the linguistic awareness because of fitness (*yogyatā*) and so on (i.e., because new individuals too are instances of universals like cowness and so on).

Text. *Atha vahnimān ayam iti anumitih viśeṣaṇa-jñāna-sādhya viśiṣṭa-jñānatvāt iti parvatīya-vahni-bhānārtham tatkalpane dhūme api tathā kvaciddhūmasyāpi vyāpakatvāditi cet*. (276)

Tran. Objection: the inference that this (say, the hill) has fire presupposes awareness of the qualifier, for (the said inference) is an awareness of something qualified. If thus that (= ubesc) is admitted to account for awareness of the fire (the pervader) in the hill (the inferential subject), that should hold for smoke (the pervaded) as well, for smoke too may be sometimes the pervader.

This is another objection to the Mīmāmsā view raised by some Nyāya philosophers (Gangesa and company not included) by way of offering another argument for admitting ubesc. It is argued that the inference that this has fire is an awareness of something qualified (*viśiṣṭa*). An awareness of something

qualified, some Nyāya philosophers hold, is preceded by awareness of the qualifier. For example, awareness that the stick is red is awareness of the stick as qualified by the red color and is possible only if there is already awareness of the red color. So the said inference too should be preceded by awareness of the qualifier. The latter happens to be the particular fire in the hill. So the said inference of that fire should be preceded by awareness of that fire.

Although other qualifiers like the specifier of subjectness (*pakṣatāvacchedaka*) and the specifier of probandumness (*sādhyatāvacchedaka*) are also involved here, the claim is not that their awareness too should come from ubesc. In fact, those Nyāya philosophers who support ubesc do not hold that ubesc is needed for awareness of these other qualifiers. Rather, the claim is that ubesc is needed for the prior awareness of the probandum which is a qualifier of the subject. The latter awareness should not be an inference or some other kind of indirect awareness, for that would open the door of infinite regress or circularity. So the latter awareness should be perceptual. But it is given that there is no ordinary sensory connection with the fire in the hill. So ubesc should be admitted to account for the prior (direct though extraordinary) awareness of the particular fire in the hill that is the probandum so that the said inference can take place. If this is granted, it should also be granted that smokeness too can provide ubesc, for smoke too may be the pervader in some cases; then it may also be held that all smokes are perceived to be pervaded by fire through ubesc.

> Text. *Na. Viśiṣṭa-vaiśiṣṭya-jñāne viśeṣaṇtā-avacchedaka-prakāraka-jñānasya āvaśyakatvena hetutvāt, tacca vṛttameva na tu viśeṣaṇa-jñānāmapi tathā gauravāt.* (277)

> Tran. Reply: No. For take awareness of something possessed of something qualified that too in its turn is qualified; in such a case awareness in which the specifier of qualifierness is featured as the qualifier is the causal condition since that is necessary, and that (= awareness in which the specifier of qualifierness is featured as the qualifer) for sure is there, but awareness of the qualifier is not so (i.e., not necessary as a causal condition), for that is superfluous.

The Mīmāmsā rejects the law that awareness of the qualifier is a necessary condition for awareness of something qualified on the ground that an exception should be made where the qualifier is itself something qualified. Accordingly, it is argued on behalf of the Mīmāmsā that in such an inference as that this has fire awareness of the qualifier is not presupposed as a causal condition. Rather, awareness in which the specifier of qualifierness is featured as the qualifier is presupposed as a causal condition. In the said inference the latter is awareness with fireness as the qualifier. Without any doubt the latter is present there before the said inference takes place. The said inference is preceded

by the remembrance that smoke is pervaded by fire; in this remembrance fireness is featured as the specifier of qualifierness. This shows that awareness of having the specifier of qualifierness as the qualifier is needed before such an inference takes place. But there is no firm evidence that awareness of the qualifier too is necessarily present before such an inference takes place. So it is superfluous to admit that and then bring in ubesc to account for the latter. In other words, the Mīmāmsā rejects that the said inference of the fire in the hill must be preceded by awareness of that fire. The Mīmāmsā agrees that the said inference must be preceded by direct awareness of some fire in which fireness is present. But previous observations of fire account for that.

One may also develop an argument for ubesc as follows. Suppose that some fire-looking things are mistaken for fire and thus, after the perception of smoke there, it is surmised that smoke is pervaded by fire. Then one may infer fire somewhere that actually has fire from seeing smoke there. Such inference of fire should not take place, one may argue, without prior sensory connection with an actual fire. If no such ordinary sensory connection has taken place before, ubesc is needed for extraordinary sensory connection with an actual fire.

But this argument is not sound. One may mistake something else as fire only if one is already aware of fire. Awareness of fire that is presupposed cannot always be false. So ordinary sensory connection with an actual fire is needed in a previous case and thus the admission of ubesc is superfluous.

> Text. *Gaurayamiti viśiṣṭa-jñāne yugapad-viśeṣye viśeṣaṇe sannikarṣa eva kāraṇam na tu nirvikalpakam mānābhāvat*. (277–78)

> Tran. In such awareness of something qualified as that this is a cow the simultaneous sensory connection with the qualificand and the qualifier is itself the causal condition and not indeterminate perception, for the evidence for that is lacking.

This deals with a consequence of rejecting the law that awareness of something qualified is invariably preceded by awareness of the qualifier. The said law serves as a premise in the inference of indeterminate perception that is accepted by many Nyāya philosophers. What then becomes the fate of indeterminate perception if the said law is rejected? In other words, in the Mīmāmsā view the inference of something qualified such as that the hill has fire is not invariably preceded by awareness of the qualified, viz., that fire. Should it then be said that perception of something qualified such as that this is a cow is also not invariably preceded by awareness of the qualifier? If so, the main reason for admitting indeterminate perception is gone.

In reply, the Mīmāmsā asserts that the rejection of indeterminate perception is intended. That is, indeterminate perception does not invariably pre-

cede determinate perception and there is no firm evidence for admitting indeterminate perception. What then invariably precedes determinate perception? It is simultaneous sensory connection with the qualificand and the qualifier. Thus if there is sensory connection with an individual cow and cowness, this may be followed by the perception that this is a cow.

Text. *Viśiṣṭa-jñānatvameva mānamiti cet? Na. Dṛśṭāntābhāvāt daṇḍī puruṣa ityatra viśeṣaṇa-dhī-janyatva-anabhyupagamāt viśiṣṭa-vaiśiṣṭya-jñānatvāt.* (278–79)

Tran. Objection: Being the awareness of something qualified itself is the evidence? Reply: No. For there is no (undisputable confirming) example; it is not admitted that awareness of the qualifier is a causal condition of (awareness of) a man with a stick, the latter being an awareness of having a qualifier that too is qualified.

The Mīmāmsā has claimed that there is no firm evidence for admitting indeterminate perception. The objector, on behalf of some Nyāya philosophers, asks: why should not the fact of being aware of something qualified provide such evidence as a probans in an inference in which the said law is a premise? In other words, what is wrong with the generalization that all cognitions of something qualified are preceded by cognition of the qualifier?

In reply it is argued that there is no undisputable confirming example for this generalization, for the cases cited by the said Nyāya philosophers are disputed by the Mīmāmsā. The latter holds that if the qualifier is itself qualified by some other property, not awareness of the qualifier but awareness of the property that qualifies the qualifier is presupposed in awareness of the qualified. This is true not only of inferences such as that of the fire in the hill but also of perceptions such as that of the man with a stick. Even in the perception of the man with a stick the prior perception of the particular stick is not needed as a causal condition in the Mīmāmsā view. What is needed is perception of stickness (that is in this case the specifier of qualifierness) and the simultaneous sensory connections with that man (the qualificand) and that stick (the qualifer). Ubesc is not needed to account for any of these. Moreover, in the Mīmāmsā view even perception of the specifier of qualifierness need not precede the determinate perception of something qualified. The sensory connection with the specifier of qualifierness too may take place simultaneously with the sensory connections with the qualificand and the qualifier.

One reason why the Mīmāmsā has reservations about the said law is that qualifiers are of different types: a qualifier may be an individual substance, a particular quality, a particular action, a universal and so on. In the same way, since the specifiers of qualifierness are also qualifiers, the specifiers of qualifierness too are of different types: a specifier of qualifierness too may be an individual substance, a universal and so on. The claim that the law applies to

all such qualifiers is a large one the burden of proof of which lies on those who need the law; that burden, in the Mīmāmsā view, has not been met.

Text. *Api ca prameyatvena vyāptim paricchindan sarvajñah syāt, tathāca parakīya-jñāna-viśaye ghatatvam na veti samśayo na syāt prameyatvena tadanyatara-niścayat*. (279–80)

Tran. Moreover, when pervasion is specified in terms of knowability, one should become all knowing. Then even when there is awareness belonging to someone else there should not be the doubt as to whether something is (or has) potness or not, for there is the ascertainment that it is one or the other with reference to knowability.

After arguing that evidence for the admission of ubesc is insufficient the Mīmāmsā now argues that there is an overriding difficulty (*bādhaka*) if ubesc is admitted. The difficulty is that one should then be all knowing, for one may have recourse to ubesc with the help of such omnilocated characters as knowability that would make everything known.

But what is the harm if one becomes all knowing? The harm is that then one should not have such a doubt as to whether something is (or has) potness or not even when one is concerned with another person's awareness. For everything, including (pots or) potness, are knowable and thus (pots or) potness or another person's awareness are already known and knowledge is an obstruction to doubt.

Text. *Prameyatvena ghatam jānātyeva ghatatavam tasya na jānāti iti cet*. (280)

Tran. Objection: A pot is for sure known in so far as it is a knowable but its potness is still not known.

The objector argues that knowing something as a knowable does not imply knowing its other more specific features such as potness. So even if everything is known through ubesc as a knowable, one may still have the doubt as to whether something is (or has) potness.

Text. *Na. Tat kim ghatatvam na prameyam yena tanna jānīyāt sakala-ghata-vṛtti-dharmasya prameyatvena tadajñānāsambhavat*. (280)

Tran. Reply: No. But is potness unknowable so that it would not be known? Since the common feature of all pots is knowable, it is not reasonable that it is not known.

If knowability is a universal class and if ubesc leads to an awareness of each member of the class, potness as a member of the universal class should also be known; then the doubt about it (i.e., anything) is ruled out.

THE ACCEPTED VIEW OF UNIVERSAL-BASED EXTRAORDINARY PERCEPTION: *SĀMĀNYALAKṢAṆĀSIDDHĀNTAH*

Text. *Ucyate. Yadi sāmānya-lakṣaṇā nāsti tadanukūla-tarkādikam vinā dhūmādau vyabhicārasamśayo na syāt, prasiddha-dhūme vahni-sambandhāvagamāt kālāntarīya-deśāntarīya-dhūmasya mānābhāvena ajñānāt*. (283–84)

Tran. The following is to be said. If ubesc were not there, without having recourse to supportive (*anukūla*) CR (*tarka*) and so on, there would have been no doubt about whether smoke and so on were deviant. For connection with fire is known in an observed smoke but a smoke at a distant time or a distant place is not cognized, no means of cognition being available.

Gangesa offers an argument for admitting ubesc. He points out a difficulty resulting from not admitting ubesc. We have doubts like whether smoke deviates from fire. Such a doubt is not targeted to observed smokes, for they have all been observed together with fire. So the doubt should be about smokes at a distant time or place. Thus smokes at a distant time or place are the qualificands of such doubt. Since the qualificand of such doubt is perceived (*samśayasya dharmyamśe pratyakṣa-rūpataya*, MN 283), sensory connection with smokes at a distant time or place is needed. But there is no ordinary sensory connection with smokes at a distant time or place, failing which the qualificand would not be perceived and the said doubt would not be possible.

Text. *Sāmānyena tu sakala-dhūmopasthitau dhūmāntare viśeṣādarśanena samśayo yujyate*. (284)

Tran. But if all smokes are cognized through the universal, doubt about another smoke is explicable, for there is lack of specific information.

Gangesa explains how the difficulty is resolved from admitting ubesc. Then smokes at a distant time or place too could be perceived through the universal smokeness without acquiring specific information about them as to that each of them is together with fire. The specific information about ordinarily observed smokes that are observed with fire rules out the doubt of deviation about them. Since there is no such specific information about distant smokes and still they are perceived, the said doubt is explicable.

Text. *Yattu pākādau cikīrṣā sukhādau icchā na syāt siddhe icchā-virahāt asiddhasya ajñānāt tasmāt sukhatvādinā jñāteṣu sarveṣu siddham vihāya asiddhe icchā bhavatīti abhyupeyam*. (285–86)

Tran. There is no desire for what is achieved and what is not achieved is not known. So the volition for cooking and so on or the desire for pleasure and so on would not have been there (without ubesc). Therefore, since all (pleasures) are known through pleasureness, there is desire for what is not achieved leaving out what is achieved.

This is another argument for ubesc. We have desire for pleasures yet to be had. But desire for something is preceded by awareness of that thing. Such awareness cannot always be indirect, for then there is the threat of infinite regress or circularity. So such awareness must ultimately be direct. But no ordinary sensory connection with future pleasures is possible. So it should be admitted that all pleasures, including future ones, are perceived through pleasureness in a general way. This makes our desire for future pleasures explicable and thus ubesc is needed.

RS notes a similar argument for ubesc. Suppose that there are negative entities (*abhāva*) and that they are perceived. Suppose also that one kind of negative entity is the absence of all things of a given kind (*sāmānyābhāva*)—for example, absence of all pots. Suppose further that when a negative entity is perceived, it is preceded by awareness of the negatum (*pratiyogin*). So if absence of all pots is perceived, that should be preceded by awareness of all pots, including future ones. Such awareness of all pots, to avoid an infinite regress or circularity, should eventually be perceptual. But no ordinary sensory connection with future pots is possible; so ubesc is needed for that [*Sāmānyābhāva-bhānārtham sā svīkāryā, tam vinā sakala-pratiyogi-jñānāsambhavāt*, RS in GD 813].

GD takes note of another argument for ubesc. Take prior absence (*prāgabhāva*) of something about to be produced, e.g., prior absence of a pot to be made by a potter out of a lump of clay. If prior absence of that pot is perceived, that should be preceded by awareness of that pot that should ultimately be perceptual. Since, again, ordinary sensory connection with that future pot is not possible, ubesc is needed for that (GD 819).

Text. *Tanna. Asiddhasya ajñāne api siddha-gocara-jñānādeva icchaā-pravṛtti-svābhāvyādasiddhe tayorutpatteh.* (287)

Tran. That is not (accepted). Even without awareness of the unrealized, desire and volition are by their very nature (caused) by awareness of what is realized and thus (is explained) the origin of them for what is unrealized.

Gangesa rejects this argument (attributed by MN to the author of *Līlāvatī*) for ubesc. Gangesa argues that there is no compelling evidence to show that direct awareness of what is unrealized is a necessary condition for the desire or volition for that. On the contrary, awareness of what is realized is a suffi-

cient condition for the desire or volition for what is unrealized (and ubesc is not needed for awareness of what is realized).

> Text. *Na ca atiprasañgah, samāna-prakārakatvena jñāneccha-kṛtīnām kārya-kāraṇa-bhāvāt na tu samāna-viṣayatvenāpi kvacidapyakalpanāt samāna-viṣayakatve satyapi samāna-prakāraka-jñānābhāvena icchā-kṛtyorabhāvāt tasya āvaśyakatvena gauravācceti para-siddhāntāt.* (286–90)

> Tran. It does not also lead to any undesirable excess. Awareness becomes a causal condition of a desire or a volition by virtue of having the same qualifier and not by virtue of being about the same thing; (the latter) is in no case admissible; even if they are about the same thing, there is absence of desire and volition if there is absence of awareness having the same qualifier, since that (having the same qualifer) is necessary, (being about the same thing) is superfluous; this is in accordance with another viewpoint.

One advantage of the view that awareness of what is unrealized is a causal condition for the desire or volition for that is that any asymmetry between awareness on the one hand and desire or volition on the other is ruled out. Gangesa argues that such asymmetry can be ruled out also for the view that awareness of what is realized is a sufficient condition for desire or volition for what is unrealized. The asymmetry is ruled out by adding the condition that such awareness and desire or volition should have the same qualifier. However, this condition should not be confused with that of being about the same thing. Awareness does not lead to desire or volition, Gangesa claims, unless they have the same qualifier even when they are about the same thing. That is, in the cause-effect relation between awareness and desire or volition the mode of presentation, the qualifier in particular, plays a crucial role and should be recognized as such.

It may be noted that RS rejects the argument for ubesc from perception of absence of all things of a given kind mentioned above. Even if it is granted that perception of such absence is preceded by awareness of the negatum, it does not follow that it should be preceded by awareness of each and every negatum. Rather, a plausible view is that such perception should be preceded by awareness of some particular negatum possessed of the qualifier of negatumness (*pratiyogitavācchedaka*). For example, take the perception of absence of all pots. Here potness is the qualifier of negatumness. Accordingly, a previous perception of a pot possessed of potness suffices to account for the said perception [*Sakala-pratiyogi-viṣayatvam tu tasya asiddham, pratiyogi-jñānasya hetutve api pratiyogitāvacchedaka-viśiṣṭa-yatkincit-pratiyogi-jñānādeva tat-sambhavāt*, RS in GD 814].

Another argument for ubesc cited above from the perception of prior absence is not open to the same objection. Here the prior perception of many or

all individuals of a kind is not presupposed. Rather the prior (extraordinary) perception of, say, a particular pot that is about to be made is presupposed. Still, the new pot too is going to be possessed of potness. Accordingly, here too a previous perception of a pot possessed of potness suffices, one may claim, to provide the ground for the said perception [*Ghatatvādi-prakāraka-jñānasya tadviśiṣṭa-ghatādyuparakta-prāgabhāva-pratyakṣe api viśiṣṭa-viśeṣaṇaka-dhiyo hetutvena apekṣā*, GD 819].

Although ubesc may be dispensable for perception of absence of all things of a kind or of perception of prior absence, it does not follow that ubesc is dispensable for the said kind of doubt. The doubt is over, say, if all smoky things are fiery. If the qualificand of such a doubt is perceived, smokes removed in space or time must be perceived and this can only take place through ubesc.

> Text. *Na ca sarvajñatve samśayo na syāditi doṣah, ghatah sa iti ghatatva-prakārakam hi jñānam samśaya-virodhi tacca na vṛttam sva-sāmagrī-virahāt, ato ghatatvādi-sakala-viśeṣa-jñāne api sa ghato na veti samśaya iti*. (290–91)

> Tran. There is also not the fault that doubt is rendered impossible because of being all knowing. It is only the awareness of that being a pot with potness as the qualifier that is opposed to the (previously mentioned) doubt, but that is not present, for its causal conditions are not available. Accordingly, although there is awareness of all things including potness and so on, the doubt about if that is a pot or not is possible.

Gangesa dismisses the objection noted earlier that ubesc rules out such common forms of doubt as to whether a given thing is a pot or not. Although everything is knowable through ubesc, that kind of awareness does not provide the specific information about anything that can oppose the said kind of doubt. It is true that all pots can be known through ubesc with the help of such a common feature as knowability (*prameyatva*). But in an awareness of a pot as a knowable, the qualifier is knowability and not potness. This is significantly different from the awareness that that is a pot with potness as the qualifier. It is the latter and not the former that is opposed to the doubt about if that is a pot or not. So the said kind of doubt is not ruled out.

This is why Gangesa says that the causal conditions of the awareness opposed to the said kind of doubt are not available in the said kind of awareness through ubesc. That is, a doubt and the opposed awareness should share the same qualifier in exactly the same way. In the doubt about if that is a pot or not, potness, being a universal that is not mentioned (*anullikhyamāna*), is featured as a qualifier without being further specified by any qualifier. In the same way, in the belief that that is a pot potness is featured as a qualifier with-

out being further specified by any qualifier. [It is the view of many Nyāya philosophers that if a universal becomes a qualifier without being mentioned, it is cognized without being specified by any other qualifier.] Such a belief is opposed to the said doubt but not the belief in which knowability is a qualifier that is further specified by a property [*Ghatah sa ityādi-samśaya-samānākāro hi niścayastadvirodhi ghato na veti samśayah kotitāvacchedake ghatatvāmśe nișprakārakaśca. Na ca prameyavāniti pratyayastathā*, RS in JD 501].

6

Earlier Views of Adjuncts: *Upādhivādah*

Text. *Upādhi-jñānāt vyabhicāra-jñāne sati na vyāpti-niścaya iti upādhih nirūpyate. Tatra upādhih sādhyatvābhimata-vyāpakatve sati sādhanatvābhimatavyāpakah.* (294–95)

Tran. Since there is no ascertainment of pervasion if there is awareness of deviation from awareness of an adjunct, the topic of adjuncts is investigated. There an adjunct is that which pervades the putative probandum and does not pervade the putative probans.

A stock example of an adjunct is wet fuel in inferring smoke from fire. Here smoke is the probandum and fire is the probans. The pervasion of fire by smoke is false. So this is not a reliable inference. Accordingly, Gangesa describes the probandum in such cases as a putative probandum and the probans as a putative probans. If adjuncts are eliminated and if the probandum and the probans are reformulated to provide a reliable pervasion, the probandum and the probans may become acceptable in such cases. Thus fire produces smoke only if the fuel is wet. Wet fuel then pervades smoke, the putative probandum, and it is true that wherever there is smoke there is wet fuel. But there is fire without wet fuel, as in a hot iron ball. Wet fuel then does not pervade fire, the putative probans, and it is not true that wherever there is fire there is wet fuel. One does observe fire to produce smoke in many cases. If one overlooks that in each such case the fuel is wet and that there can be fire without wet fuel, one may falsely generalize that all fiery things are smoky and seek to infer smoke from fire. Such an inference is false. But if the putative probans is restated as fire produced by wet fuel, the pervasion is reliable. That is, all fiery things with wet fuel are smoky is a reliable generalization. Hence fire pro-

duced by wet fuel, although not fire by itself, is a reliable mark (*saddhetu*) for inferring smoke.

In the above example a thing having fire, a thing having smoke and a thing having wet fuel may respectively be symbolized as M, P and A. Now we have the following situation. (1) All M is P is false. (2) All P is A is true. (3) All M is A is false. (1) follows logically from (2) and (3). Since P is included in A and M is not included in A, it must be that M is not included in P. In other words, we have the following formally valid argument:

All P is A.
Some M is not A.
Therefore, some M is not P.

In terms of class logic, since the intersection of P and the complement of A is empty and the intersection of M and the complement of A is non-empty, it follows that the intersection of M and the complement of P is non-empty. Alternatively, by using the standard notation of modern symbolic logic this may be formulated as below:

(X) (Px ---Ax) [The three hyphens represent the material conditional.]
(#x) (Mx & ~Ax) [#x represents the existential quantifier.]
Therefore (#x) (Mx & ~Px)

Thus it is logically necessary that a generalization in which an adjunct is involved is false. Since Nyāya texts are expected to be read with the help and guidance of a teacher who would supply the implied background information including formal laws to a beginning reader, the formal rules are usually left understood. But without any doubt the formal truths are an integral part of Nyāya logic. Indeed, the discourse on adjuncts provides clear evidence for the high level of sophistication and development achieved by Nyāya logicians in the areas of both formal and informal logic. A primary task here is to detect a condition that undermines an apparently sound generalization and avoid a pitfall in induction. Thus material truth or adequate epistemic warrant for an induction is a main concern. Still, such detection includes the employment of a sophisticated deductive technique that is interesting on its own as a formal exercise. Some modern scholars tend to ignore, overlook, misrepresent or downgrade the formal aspect of Nyāya logic. But a formal rule does not cease to be formal if it is employed in the search for material truth or soundness. Indeed, a fruitful blend of the deductive and the inductive, of the formal and the informal, to provide the foundation for sound or reliable inference is a characteristic hallmark of Nyāya logic.

However, as the stock example shows, P and A may be extensionally equivalent so that A is also included in P. Then the intersection of A and C too is included in B. This shows that although the induction that all A is B is false, the induction that all members of the intersection of A and C are B is reliable under the said circumstances. The study of adjuncts not only shows that under certain circumstances an induction must be false but also that under certain circumstances the induction may be revised by replacing the putative pervaded with the intersection of the said pervaded and the adjunct that is reliably pervaded by what is initially taken to be the pervader. Thus the topic throws light on detecting false inductions that appear to be amply supported by observation and also on one way of correcting them and changing them to reliable ones in some cases. Thus the discussion of adjuncts makes a valuable contribution to formal logic and also heralds a substantial progress in the study of the scientific method.

RS remarks that since a (proper) probans-probandum relationship is not possible if an adjunct is involved, Gangesa has described them as "putative" or "intended" [*Sopādhau sādhyatva-sādhanatve na sambhavatah atah abhimateti*, RS in GD 877]. This is consistent with the convention of letting *hetu* or probans be short for *saddhetu* or a reliable probans and labeling what appears like a probans but is not as *hetvabhasa* or a pseudo-probans. RS also rephrases Gangesa's account of an adjunct by replacing the terms probans and probandum with the pronominal variable "that" (*yat*): that which pervades something and does not pervade something (else) is an adjunct there [*Yo yat-vyāpakatve sati yat-avyāpakah sa tatra upādhih*, RS in GD 877]. The switch to the pronominal variables brings out the formal structure clearly. Finally, RS observes that pervasiveness and nonpervasiveness are intended to be in the same sense [*Vyāpakatvāvyapakatve eka-rūpeṇa vivakṣite*, RS in GD 877]. This is needed; if something pervades the probandum in one sense and does not pervade the probans in another sense, the pervasion may not be necessarily false.

Text. *Anaupādhikatva-jñānam ca na vyāpti-jñāne hetuh, ato vyāpakatvādi-jñāne na anyonyāśrayah*. (295)

Tran. Awareness of being devoid of adjuncts is not a causal condition of awareness of pervasion; hence no circularity is involved in the awareness of pervasiveness and so on.

This is in response to an anticipated objection. Since pervasion is possible only if no adjuncts are involved, one may hold that awareness of lack of adjuncts is a causal condition of awareness of pervasion. However, an adjunct is explained as that which pervades the putative probandum and does not pervade the putative probans. Thus the account of an adjunct mentions pervasion and

awareness of pervasion becomes a causal condition of awareness of an adjunct. At the same time, awareness of adjuncts is a causal condition of awareness of lack of adjuncts that again appears to be a causal condition of awareness of pervasion. This seems to show mutual dependence or circularity.

Gangesa avoids the objection by holding that awareness of lack of adjuncts is not a causal condition of awareness of pervasion. That is, awareness of pervasion may take place even if one is not aware that no adjuncts are involved. A distinction must be made between lack of awareness of adjuncts and awareness of lack of adjuncts. While the former is a causal condition of awareness of pervasion (since awareness of an adjunct is an obstruction to awareness of pervasion), the latter is not.

> Text. *Yadvā vyāpakatvam tadvanniṣṭha-atyantābhāva-apratiyogitvam, tat-pratiyogitvam ca avyāpakatvam; pratiyogitvam ca tadadhikaraṇa-anadhikaraṇatvamiti vadanti.* (296–99)

> Tran. Or being pervasive is not being the negatum of (any) absolute absence located in the substratum of that (i.e., the pervaded), and being not pervasive is being the negatum of that (i.e., an absolute absence located in the substratum of the putative pervaded); further, being the negatum is (meant to be) not being (or being opposed to) the locus of the locus of that (i.e., the negatum)—as some say.

This is an alternative response to the charge of mutual dependence mentioned above. The point is that an account of pervasion may be given without an explicit mention of adjuncts. So even if an explicit mention of pervasion is included in the account of an adjunct, there is no mutual dependence. Accordingly, Gangesa gives an account of pervasion that leaves out any explicit reference to adjuncts as follows. If something is not the negatum of any absolute absence belonging to the locus of something, it is everywhere present in the locus of the latter; thus it pervades the latter. If it is the negatum of any such absence in the locus of the latter, it is absent at least in one place where the latter is present and does not pervade the latter.

The last remark about the negatum in the text addresses, as RS observes (RS in GD 990), nonpervasive (*avyāpyavṛtti*) features such as contact; in these cases both presence and absence of something belong to the same thing at the same time. For example, a tree that is in contact with a monkey in one branch may not be in contact with that monkey in another branch (or may not be in contact with any monkey in another branch). To include such cases′ absence is understood as that which is not co-located with the negatum (*pratiyogi-vyadhikaraṇa* or *pratiyogyadhikaraṇānadhikarana*). Thus the last occurrence of the word "tat" in the above text may be taken to refer to the negatum.

Text. *Tanna, sādhana-pakṣa-dharma-avacchinna-sādhya-vyāpaka-upādhi-avyāpteh*. (299)

Tran. Objection: That (i.e., the account of an adjunct as that which pervades the putative probandum and does not pervade the putative probans) is not acceptable, for it fails to apply to adjuncts that pervade probanda as (a) specified by the mark or (b) as specified by a feature of the inferential subject.

An objector argues that the given account of an adjunct is too narrow and leaves out some types of adjuncts. One type of an adjunct that is arguably left out by the said account is provided by cases of probanda specified by the mark. An example of an adjunct that pervades the probandum as specified by the mark is being due to consumption of certain vegetables in the (questionable) inference that the lame man is dark because of being a child of Mitra (a woman) (MN 300). All dark persons that are also children of Mitra may be dark because Mitra, the mother, consumed certain vegetables and such food habit may be a causal condition of their dark complexion. In such a case the consumption of certain vegetables is taken to pervade the putative probandum of being dark as specified or restricted by the mark, viz., being a child of Mitra. That is, all dark persons who are children of Mitra are also presumably persons for whom consumption of certain vegetables by their mother contributed to their dark complexion. But other dark persons may not have mothers with the same food habit and may be dark for other reasons such as perhaps that the father was dark. So being due to the consumption of certain vegetables may very well fail to pervade the putative probandum of being dark without the said specification; accordingly, the given account of an adjunct would fail to apply here and be too narrow. [A slightly different version of the example is that the future child of Mitra, who is pregnant, will be dark because of being a child of Mitra: the presumption is that since all the existing children of Mitra are dark, the next one will be dark too. Here it is overlooked that Mitra may have been on a diet of certain vegetables during her previous pregnancies that contributed to the dark complexion of her children born so far. If she has discontinued that diet and switched to a different diet, her next child may not be dark.]

Another type of an adjunct that appears to be left out by the said account is found in cases of probanda specified by a feature of the inferential subject. An example of an adjunct that pervades the probandum as specified by a feature of the inferential subject is having manifest color in the (questionable) inference that air is perceived because of being the substratum of a perceived object (MN 300). It is taken for granted here in the light of Nyāya ontology that air is an external substance that possesses perceptible touch but not manifest color. Whether air is perceptible is disputed. Those who

hold that air is perceived argue that air is perceived because it has perceptible touch and is thus the substratum of a perceived object. Those who hold that air is not perceived but only inferred from perceptible touch argue that the said inference is vitiated by an adjunct, viz., manifest color. In the latter view only those external substances that have manifest color are perceived. Since air is an external substance that lacks manifest color, it is not perceived. In other words, manifest color pervades all undisputed cases of perception of external substances where being an external substance is a feature of air, the inferential subject. Thus manifest color pervades the probandum if it is specified or restricted by a feature of the inferential subject. However, manifest color does not pervade all undisputed cases of perception, the putative probandum, without such specification, for things that are internally perceived, for example, are colorless. Thus the above account of an adjunct as that which pervades the putative probandum fails to apply to manifest color.

Text. *Na ca tayoh anupādhitvam, duṣakatā-bīja-sāmyāt*. (299–300)

Tran. Not that these are not adjuncts, for the basis of faultiness is the same.

One could say that these are not adjuncts proper; so the above account is not intended to apply to them. This is rejected, for these too provide grounds of deviation as adjuncts do (MN 300). A probandum specified by the mark may be symbolized as P & M and a probandum specified by a feature of the inferential subject may be symbolized as P & S. The above two cases may now be symbolized as below:

(a) All P & M is A.
Some M is not A.
Therefore, some M is not (P & M)

(b) All P & S is A.
Some M is not A.
Therefore, some M is not (P & S).

It no longer follows logically that some M is not P as it follows logically in the case of an adjunct (explained earlier). On the face of it then the objector's claim appears not to be justified. However, Gangesa himself suggests a remedy later.

Text. *Mitrā-tanayatvena śyāmatva-sādhane śākapākajatvasya pratyaksa-sparśa-āśrayatvena vāyoh pratyakṣatve sādhye udbhūta-rūpavatvasya ca śāstre prayojakatvena upādhitva-svīkārāt ceti*. (300–301)

Tran. That being due to the consumption of certain vegetables is an adjunct in inferring dark complexion on the ground of being a child of Mitra and that having manifest color is an adjunct in inferring that air is perceptible on the ground of possessing perceived touch are accepted in systematic studies, for they provide grounds (for deviation).

These examples refer to the point made above.

Text. *Pakṣetare ativyāpteśca.* (301)

Tran. Since (the account of an adjunct) also overextends to (the property of) being other than the inferential subject, (the account is not acceptable).

After arguing that the given account of an adjunct is too narrow an objector now argues that the account is also too wide. To show that the account is too wide the objector brings in the cooked-up property of bois to which a major part of the discussion that follows is devoted. It is already granted that the inferential subject is not a positive instance. So bois is necessarily present in all positive instances and thus appears to pervade the probandum. At the same time, the said property cannot pervade the mark: the mark is taken to be present in the inferential subject where bois must be absent, for the inferential subject cannot be other than itself. Thus bois appears to pervade any probanda and not to pervade any mark and always qualify as an adjunct. In a substitution instance such as the inference that the hill has smoke because of fire, being other than the hill (the inferential subject) appears to fulfill the requisite conditions of an adjunct. The property of being other than the hill is not the negatum of any absolute absence in the locus of smoke, the probandum, for all undisputed smoke-possessing things are different from the said hill. The said hill is the subject of inference; hence it does not qualify as an undisputed smoke-possessing thing then. Being other than the hill is also the negatum of an absolute absence in the locus of fire, the mark. There is fire in the said hill, but the hill is not different from itself, so being other than the hill is absent in the hill. Since being other than the hill appears to pervade the probandum smoke and also not to pervade the probans fire, it seems to satisfy the given definition of an adjunct.

But bois, the objector suggests, should not be accepted as an adjunct, for it threatens soundness of such inferences as that of fire from smoke in the hill. In this inference too being other than the hill is not the negatum of any absolute absence in the locus of fire, the probandum, for all undisputed fire-possessing things are different from the said hill. The said hill, again, is the subject of inference; hence it does not qualify as an undisputed fire-possessing thing then. Being other than the hill is also the negatum of an absolute absence in

the locus of smoke, the probans. There is smoke in the said hill, but the hill is the same as itself, so being other than the hill is absent in the hill. Accordingly, further analysis and some other definition that shows that bois is not an adjunct proper is needed—so argues the objector. This objection is the subject of much discussion to follow; we refer to it as the overextension objection.

Text. *Na ca vyatireke parvatetarānyatvāt ityatra itarānayatvasya asiddhi-vāraṇārtham parvata-padam viśeṣaṇam iti vyatireke vyartha-viśeṣaṇatvāt na sa upadhih, bādhonnītasyāpi anupādhitā-āpatteh. Na ca iṣṭa-āpattih, itarānyatvasya aprasiddhyā viśeṣaṇam vinā vyāptyagraheṇa tat-sārthakatvāt*. (301–3)

Tran. Objection to the overextension objection: Take the case of "being different from the hill" in inferring absence (of the probandum); here the term "hill" is needed as a qualifier to avoid failure of presence of the mark in the inferential subject; since then the qualifier is superfluous (for it does not prevent deviation and only a qualifier that is needed to prevent deviation is not superfluous—one may hold), it is not an adjunct.

Reply to objection to the objection: This is not accepted, for then (bois) in the case of a countermanded mark too would not be an adjunct. The latter is also not desirable; since (merely) being different from the other is not feasible, there can be no generalization without the qualifier (such as the hill) and hence it (the qualifier) is useful.

This is first an attempt to set aside the charge of overextension by showing that bois is not an adjunct proper. An adjunct proper allows one to infer soundly absence of the probandum in the inferential subject from absence of the adjunct in the inferential subject. An adjunct pervades the probandum that implies by way of contraposition that absence of the probandum pervades absence of the adjunct. The objector to the overextension objection argues that bois would eventually fail to yield a probans in inferring absence of the probandum because it contains a superfluous qualifier, viz., the inferential subject (a substitution instance of which is the hill in the inference of smoke in the hill from fire). Without this qualifier the mark would simply be "being different from another thing"; then it would fail to belong to the inferential subject, for everything has an "other" and nothing fits the description (i.e., the inferential subject will have to be the other of something and could not be different from the other) (MN 301). But then the said qualifier is not needed to prevent deviation. Since, according to the objector to the overextension objection, only a qualifier needed to prevent deviation is not superfluous, the said qualifier is superfluous. Something with a superfluous qualifier cannot be an acceptable probans, for allowing superfluous qualifiers is nonparsimonious. Then such a feature cannot also be used to infer soundly absence of the probandum on the ground of its own absence (as it should be with an adjunct proper) and thus it should not be recog-

nized as an adjunct. Accordingly, the concern from bois threatening the status of even sound inferences is unfounded.

In reply and in defense of the overextension objection the case of a countermanded mark is mentioned such as that fire is not hot because of being a product. Here that fire is hot or that the putative probandum, viz., not being hot, is absent in the subject, viz., fire, is already known; thus it is already known that what is sought to be inferred is false. Since absence of the probandum in the subject is already known, a mark in such a case is called countermanded (*bādhita*). In the above example being other than the subject amounts to being other than fire. However, in "being other than fire" the inclusion of fire is necessary, for otherwise that it pervades the probandum cannot be established. That is, while we can assert that all things that are not hot are different from fire, we are not justified in asserting merely that all things that are not hot are different from another thing: it is true of anything and everything that it is the other of something and hence is not different from the other. Since the inclusion of the qualifier is needed for the sake of the said generalization, it is useful in cases of countermanding as well as in other cases. If the charge of including a superfluous qualifier fails, there is no bar to bois being an adjunct proper in a case of countermanding as well as in other cases. That is, absence of the said property can be a probans in inferring soundly absence of the probandum in the inferential subject in such cases. The concern from bois posing a threat to sound inferences is not then groundless.

> Text. *Vastugatyā sādhya-vyāpakah pakṣetara upādhiriti cet, astu tathā, tathāpi pakṣa-atirikte sādhya-vyāpakatā-grahāt upādheh dūṣakatvam, tat ca tatrāpi asti, anyathā pakṣe sādhya-sandehāt anupādhitve upādhi-mātram ucchidyeta*. (303–4)

> Tran. Objection (to the overextension objection): being other than the inferential subject is an adjunct (only) when it pervades the probandum as a matter of fact. Reply: Let that be. Nevertheless, an adjunct is a flaw by virtue of being grasped to pervade the probandum in cases excluding the inferential subject. That is true of that case (i.e., being other than the inferential subject in a sound inference) too. Otherwise, if something is disqualified from being an adjunct because of the suspicion that the probandum may be present in the inferential subject, all adjuncts are disqualified.

This is a second attempt to set aside the charge of overextension. The objector to the overextension objection now argues that bois should be an adjunct only if it pervades the probandum as a matter of fact. This is possible in a case of countermanding, for the probandum is known to be absent in the inferential subject in this case. Although then bois cannot be present in the inferen-

tial subject (that cannot be other than itself), there is no fear of bois failing to pervade the probandum if the inference is sound and the probandum is present in the inferential subject. But bois cannot as a matter of fact pervade the probandum in a sound inference that eventually shows presence of the probandum in the inferential subject where bois must be absent [*Vastugatyā iti. Tathā ca pakse sādhyavati taditaratvam sādhya-avyāpakam tat-rahite ca bādha-unnītatvāt upādhih eva iti bhāvah*, RS in GD 894]. Thus bois can be an adjunct in a case of countermanding, for bois can as a matter of fact pervade the probandum and cannot as a matter of fact pervade the mark (that is taken to be present in the inferential subject where bois cannot be present). It is also clear that the given account of an adjunct applies to bois in a case of countermanding. But bois cannot be an adjunct in a sound inference for the reason above and the given account of an adjunct does not apply to that either. Thus the charge that the given account overextends to bois in sound inferences is not proper.

In reply and in defense of the charge of overextension it is argued that when an adjunct is said to pervade the probandum, this is meant to cover only all cases where the probandum is definitely known to be present (i.e., only all positive instances). Since the presence or absence of the probandum is dubious in the inferential subject, the inferential subject is not a positive instance and is excluded. That is, the claim that the adjunct pervades the probandum is justified, according to the objector, if it is shown that the former is present in every certain locus of the probandum and that excludes the inferential subject. But this holds of bois in a sound inference such as that of fire in the hill from smoke [*"Tat ca" tādṛśa-sādhya-vyāpakatā-jñānam ca, "tatra api" iti bādha-anunnīta-pakṣetaratve api iti arthah*, MN 302]. By definition the property of being other the hill is present in all positive instances like a kitchen and in this sense pervades fire but is absent in the hill that is taken to have smoke and does not pervade smoke.

Indeed, if possible presence of the probandum in the inferential subject suffices to disqualify something from pervading the probandum, even accepted adjuncts would be disqualified, for in such cases the adjunct is taken to be absent in the inferential subject where the presence (or absence) of the probandum is not ruled out [*Upādhi-mātram iti. Pakṣe sādhya-sandeha-daśāyam pakṣa-avṛttītvena gṛhītasya upādhimātrasya sādhya-vyāpakatva-niścaya ucchidyeta iti arthah*, MN 302]. An accepted adjunct paves the way for inferring soundly absence of the probandum in the inferential subject from absence of that adjunct in the inferential subject. For that to be possible, the adjunct should be reliably known to pervade the probandum in spite of the possible presence of the probandum in the inferential subject. The suspected presence of the probandum in the inferential subject or the suspicion of de-

viation following from that cannot accordingly obstruct the ascertainment that the probandum is pervaded [*Pakṣe sādhya-sandehah tat-āhita-vyabhicāra-samśayo vā na sādhya-vyāpakatā-niścaya-paripanthī*, MN 303].

Text. *Vipakṣa-avyāvartaka-viśeṣaṇa-śūnyatvam viśeṣaṇam tena bādha-unnīta-pakṣetarasya parigrahah, tatra pakṣasy eva vipakṣatvāt, na tu parvatetaratvādeh iti cet*. (304–5)

Tran. Objection (to the overextension objection): An (additional) condition (*viśeṣaṇa*) is that (an adjunct) should be without any qualifier that does not prevent presence (of the adjunct) in a negative instance. In the light of this bois in cases of countermanded marks is recognized (as an adjunct), for there the inferential subject itself is something where the probandum is known to be absent; but this does not apply to being other than the hill and so on.

This is a third attempt to refute the overextension objection. The suggestion is that an adjunct should not only pervade the putative probandum and not pervade the putative mark (as said before), but, additionally, should not also include anything that does not prevent presence of the adjunct in a negative instance [*Svaghatakībhūta-vipakṣa-avyāvartaka-viśeṣaṇa-sunyam yat sādhyavyāpakatva-sādhanāvyāpakatvacchedakam tadvattvam upādhitvam*, MN 304]. Prevention of presence in a negative instance boils down to being pervaded. Thus an adjunct should not only pervade the probandum but also be pervaded by it and be coextensive with the probandum. (More discussion of this view of an adjunct is found later.) With this modification the objector (to the overextension objection) seeks again to isolate cases of countermanded marks. Take the familiar case that fire is not hot because of being a product. Here bois amounts to not being fire. Since not being hot is the probandum, anything hot is a negative instance. The property of not being fire is absent in all such negative instances, for all hot things do have fire. Thus bois pervades the probandum (in the light of the above criterion that pervasion is grasped from presence in positive instances: all things that are not hot and are positive instances are also other than fire). Bois is also pervaded by the probandum and the two are coextensive (*samavyāpta*). Thus bois may be accepted as an adjunct in cases of countermanding [*Ukta-viśeṣaṇasya . . . na bādha-unnīta-pakṣetaras-vyāvartakatā tatra api tatsattvāt*, GD 897]. Now take a sound inference like that of fire in the hill from smoke. A lake and so on where there is no fire are negative instances in this case. But these negative instances are also different from the hill, the inferential subject. Although not being the hill may be said to pervade the probandum fire in the light of the above criterion, the said property is not pervaded by fire and is not coextensive with it. Accordingly, bois should not be accepted as an adjunct in sound inferences and the charge of overextension is avoided.

Text. *Na. Na hi vastu vipaksa-avyāvartaka-viśeṣana-śūnyam, sarvatra prameyatvādeh sattvāt. Tatra upātteti viśeṣaṇe siddhyasiddhi-vyāghātah.* (305)

Tran. Reply: No. It is not that a thing is without qualifiers that are not needed to prevent presence in a negative instance, for knowability and so on are present everywhere. If the specification (of being devoid of qualifiers that are not needed to prevent presence in a negative instance) is added there (viz., in the account of an adjunct), there is conflict irrespective of whether the qualifier is acceptable (*siddha*) or unacceptable (*asiddha*).

All things are knowable, nameable and so on in the Nyāya view (which does not imply that all things are known or named by us). Thus knowability belongs to everything, but knowability is not useful for preventing presence in a negative instance by way of narrowing down the scope of the reference, for a negative instance too is knowable. Since features like knowability belong to everything, there is nothing that is devoid of features that do not prevent presence in a negative instance. If the requirement of being devoid of features that are not needed to prevent presence in a negative instance were then added in the account of an adjunct, nothing could fulfill it. Thus the above modification to show that bois cannot be an adjunct in sound inferences is not acceptable.

[Phillips reads the above text differently and this affects his analysis of the third attempt to refute the overextension charge. In our view the text does not say that bois occurs everywhere (except on that subject) like such properties as being knowable as Phillips reads it (47). Rather, the text says that nothing is without a qualifier that does not prevent presence in a negative instance, for knowability and so on (that are qualifers that do not prevent presence in a negative instance) are present in everything. Phillips later observes that apparently there was some confusion or disagreement in Gangesa and others about whether the inferential subject should be understood as a bare particular or something else. But there is no such confusion in Gangesa and others who have at their disposal qualifiers like "thisness," "this-individualness" and so on to make clear what the intended inferential subject is and, if explicit signs are missing, this can always be gathered from the context if and when that makes a logical difference. The fact that proper Sanskrit does not require articles need not contribute to the confusion (contrary to the concern expressed in Phillips, 49). Because of the oral tradition Nyāya authors expect a beginner to get the help of an expert. If one is properly trained by an expert, one should be able to figure out the nature of the inferential subject.]

Text. *Tathāpi ca sādhya-vyāpakatva-sādhana-avyāpakatve tatra sta iti tadvyāvṛttyā pakṣe sādhya-vyāvṛttih ato hetoh vyabhicāra eva vyabhicāre ca avaśyam upādhih iti pakṣetara eva tatra upādhih syāt tāvanmātrasyaiva dūṣakatvāt ca vyartham viśeṣaṇam.* (305–6)

Tran. Further, since it (bois) pervades the probandum and does not pervade the mark, absence of the probandum in the inferential subject follows from its (the adjunct's) absence in the inferential subject; accordingly, the mark turns out to be deviant. Deviation implies an adjunct; thus bois is for sure an adjunct there, for that (viz., deviation on the said ground) alone suffices as a flaw; the said specification (of being devoid of features that are not needed to prevent presence in a negative instance) is then superfluous.

This passage utilizes the formal law that absence of the pervader implies absence of the pervaded (*vyāpaka-abhāvāt vyāpya-abhāvah*). Bois is not true of the inferential subject. (This is an instance of the law that A is not non-A.) Since bois pervades the probandum but not the mark and since the former is absent in the inferential subject, it follows logically that the probandum is absent in the inferential subject. It then follows that the mark is deviant, for the latter is taken to be present in the inferential subject where the probandum is shown to be absent. Thus deviation is established without having recourse to the said modification; this shows that the latter is superfluous and should be dropped. Since bois appears thus to prove deviation in cases including sound inferences, it appears to be an adjunct in all such cases so that the charge of overextension remains and the modification introduced to refute the charge fails to do the job.

Text. *Ataeva anumāna-mātra-ucchedakatayā jātitvāt na pakṣetara upādhiriti apāstam dūṣaṇa-samarthatvena jātitva-abhāvāt*. (306)

Tran. Objection: Since "being other than the subject" nullifies the legitimacy of all inferences, it is a futile rejoinder and therefore not an adjunct.

Reply: This is rejected. Since it suffices as a ground of refutation, it is not a futile rejoinder.

A futile rejoinder (*jāti*) is a refutation that is self-refuting (*svavyāghātakam uttaram*). The objector argues that bois renders all inferring questionable; thus it also makes the inference of absence of the probandum in the subject from absence of the adjunct questionable [*Sarvatra eva anumāne pakṣetarasya upādhitayā udbhāvana-sambhavāt pakṣetaratva-vyabhicāreṇa sādhya-vyabhicāra-anumānam api na sambhavati*, GD 900]. Thus it undercuts the very reason for an adjunct and is self-refuting. In reply, it is argued that the reasoning about bois to show that the mark is deviant is sound. Hence it is not a futile rejoinder. So some other solution to the problem of overextension is needed.

Text. *Etena pakṣetara-vyāvṛttyartham prakārāntaram api nirastam upādhitva-abhāve api dūṣaṇa-samarthatvāt*. (306)

Tran. This goes to show that another way of eliminating "being other than the subject" is also not acceptable, for even if (bois) is not an adjunct, it still suffices as a ground of refutation.

The main issue is not a terminological one over whether bois is an adjunct or not. Even if it is not an adjunct but a proper ground of refutation, the issue of if bois affects the soundness of inferences has to be addressed. MN suggests that the other way in the text refers to restricting bois as an adjunct only to cases of countermanded marks [*Prakārāntaram iti bādha-anunnīta-pakṣetara-bhinnatvādikam iti*, MN 306]. That is, one could simply lay down that bois is not an adjunct except in cases of countermanding. But that would be ad hoc and bois could still be a flaw and if so, threaten the status of inference as a source of knowing.

Text. *Atha upādhih sva-vyatirekena sat-pratipakṣatayā dūṣaṇam pakṣetara-vyatirekaśca na sādhyābhāva-sādhakah asādhāraṇṇatvāt*. (306–7)

Tran. Objection (to the overextension objection): Again, an adjunct is a flaw by way of a counterinference (showing absence of the probandum in the inferential subject: *sat-pratipakṣatayā*) from its absence (in the inferential subject). But absence of bois (in the inferential subject) does not prove absence of the probandum (in the inferential subject), for it is unique (*asādhāraṇa*).

This is a fourth attempt to dislodge the overextension objection. MN suggests that *sat-pratipakṣatayā* should be construed as showing absence of the probandum (in the inferential subject) [*Sat-pratipakṣatayā sādhya-abhāva-sādhakatayā*, MN 306]. Being unique to the inferential subject or uniqueness is the flaw of being absent from all places where the probandum is definitely known to be present as well as being absent from all places where the probandum is definitely known to be absent [*Asādhāraṇatvāt iti sapakṣa-vipakṣa-vyāvṛttatvāt iti*, MN 306]. The point is that bois does not behave like other accepted adjuncts. Take the case of wet fuel in inferring smoke in the hill from fire. Absence of wet fuel is not missing from all things that are without smoke: there is no smoke in a hot iron and there is also absence of wet fuel there. But absence of "being other than the hill" is missing from all things that are already known to be without smoke: there is no smoke in a hot iron and since that hot iron is other than the hill, there is no absence of "being other than the hill" there. Moreover, it follows from the very definition that bois must be present everywhere except the inferential subject; hence absence of that cannot be co-located with absence of the probandum in a positive instance and the flaw of uniqueness is unavoidable. Because of this flaw absence of bois fails to prove absence of the probandum and no counterinference is possible. Since no counterinference is possible and since an adjunct should provide for a counterinference, bois should not be counted as an adjunct and the charge of overextension and the consequent threat to sound inferences are groundless. The point continues in the following text.

Text. *Na tu vyabhicāra-unnāyakatayaā dūṣaṇam; yathā hi sādhya-vyāpaka-upādhi-avyāpyatayaā hetoh sādhya-avyāpyatvam tathā sādhya-vyāpya-hetu-avyāpakatayā upādheh na sādhya-vyāpakatvam api siddhyet vyāpti-grāhakasya ubhayatra api sāmyena vinigamaka-virahāt. Tasmāt yathā sādhya-vyāpyenā hetuna sādhyam sādhanīyam tathā sādhya-vyāpaka-upādhi-vyāvṛttyā sādhya-abhāvah api sādhanīyo vyāpti-graha-taulyāt iti dūṣakatā-bijam. Sah ayam sat-pratipakṣa eva iti cet*. (307–8)

Tran. It is not also that the flaw (from an adjunct) consists in providing the ground of deviation. Just as that the mark is not pervaded by the probandum follows from that the mark is not pervaded by the adjunct which latter pervades the probandum, so also that the adjunct does not pervade the probandum should follow from that the adjunct does not pervade the mark which is pervaded by the probandum, for the grounds of generalization being equivalent, there is no reason to choose (*vinigamaka*) one over the other. Therefore, just as the probandum is provable from a probans that is pervaded by the probandum, so also absence of the probandum is provable from absence of an adjunct that pervades the probandum, for the grounds of generalization are equivalent—and this is the basis of the flaw. This (an adjunct) then is a case of counterinference (proving absence of the probandum in the inferential subject) for sure.

One could argue that the flaw of uniqueness is inappropriate because an adjunct suffices to prove deviation: hence this passage. It is counterargued that an adjunct does not suffice to prove deviation for the following reason. That the mark is deviant or not pervaded by the probandum logically follows from that the mark is not pervaded by the adjunct that in its turn (supposedly) pervades the probandum. This may be symbolized as follows: let M stand for the mark, P for the probandum and A for the adjunct.

Not all M is A
All P is A
Therefore, not all M is P

In other words:

Some M is not A.
All P is A.
Therefore, some M is not P.

It may be seen that the argument is valid in accordance with the rules of categorical syllogism. The middle term is distributed in the first premise as the predicate of a particular negative proposition; the major term is distrib-

uted in the conclusion but also in the second premise. The conclusion is negative while one of the premises is negative.

However, we also have the following: that the adjunct does not pervade the probandum logically follows from that adjunct does not pervade the mark that is (supposedly) pervaded by the probandum. This may be symbolized as below.

Not all M is A
All M is P
Therefore, not all P is A.

In other words:

Some M is not A.
All M is P
Therefore, some P is not A.

Again we have a valid argument. The middle term is distributed once in the second premise as the subject of a universal affirmative proposition. The major term is distributed in the conclusion and also in the first premise. The conclusion is negative while one of the premises is negative.

Thus we have two valid arguments that together form an inconsistent set. One of the premises of the first argument is that all P is A, but the conclusion of the second argument is that some P is not A. "All P is A" and "some P is not A" are contradictory.

The crucial point is that both the inference of the probandum in the inferential subject and the inference of absence of the probandum in the inferential subject are equally matched. Accordingly, an adjunct is a flaw by way of providing the material for a counterinference.

GD points out that the above holds in the following situation. The probandum and the adjunct are perceived together in some places and the probandum is not perceived without the adjunct; thus there is prima facie observational support for the induction that all P is A. Further, the mark and the probandum are perceived together in some places and the mark is not perceived without the probandum; thus there is prima facie observational support also for the generalization that all M is P [*Vyāpti-grāhakasya. Vyabhicāra-niścaya-viraha-sahakṛta-sahacāra-darśanasya. Ubhayatra. Sādhya-upādhyoh hetu-sādhyayoh ca*, GD 902]. In the light of both arguments, we have both that some M is not P and that all M is P that are contradictory.

MN remarks: the above situation is possible and is in accordance with the viewpoint that the introduction of adjuncts in an argument is not useful if the mark is overtly known to be deviant [*Na hi tadānim hetau sādhya-vyabhicāra-jñānam api asti, sphute vyabhicāre upādhi-upanyāsasya vaiyarthyāt*, MN 307].

MN also observes this. Awareness that the mark is deviant from the adjunct necessarily (*avaśyam*) involves also awareness that the adjunct does not pervade the mark, for their contents are equivalent (*samāna-samvit-samvedyatvāt*, or for being cognizable through equivalent cognitions, MN 307). His general point is that certain judgments necessarily or epistemically or logically imply certain judgments, for they are necessarily or epistemically or logically equivalent. Clearly the two judgments and cognitions are different, for they have different qualificands and qualifiers. Still their contents though not the same are equivalent (*samāna*). Another term used for the same purpose is *tulya-vitti-vedyatva* or being equal in cognizability or being epistemically equal. Yet two other terms are *samāna-viṣayakatva* or having the same content and *samāna-arthakatva* or having the same meaning. These are some of the ways in which epistemic or semantic or logical equivalence is expressed in Nyāya logic (although the Nyāya concepts and the modern concepts are not the same).

Text. *Mā evam. Evam hi sat-pratipakṣe upādhi-udbhāvanam na syāt sat-pratipakṣāntaravat.* (308)

Tran. Reply to objection to the overextension objection: Not so. In that case one would not have looked for an adjunct in the counterinference in the same way (one does not bring up) another counterinference.

The objector argues again that the given account of an adjunct overextends to bois that threatens even sound inferences. When there is a counterinference, there is no logical need for another counterinference, for the counterinference is an equal match of the first inference. The first inference seeks to prove from the mark that the probandum belongs to the inferential subject. The counterinference seeks to prove from some other mark that absence of the probandum belongs to the inferential subject. Thus the first inference is countered by the second inference and the latter is countered by the first inference. There can be then no logical need for another inference to counter either the first or the second inference provided both are equally matched. But there is still no bar to searching for or finding an adjunct in the counterinference. If an adjunct merely provided for a counterinference, the adjunct would have been unnecessary. Since the aim of the counterinference is to prove absence of the probandum, the task of the adjunct would have been to prove absence of absence of the probandum (i.e., to prove the probandum). But this is already the aim of the mark of the first inference [*Upādhi-udbhāvanam na syāt. Na upayujyeta. Tat-sādhanīyasya sādhya-abhava-abhāva-rūpa-sādhyasya sādhanaya prayuktāt prathama-hetoh eva pratihetoh viruddhatvāt*, GD 903]. An adjunct then does not provide for a counterinference but rather vitiates an argument in some other way and, therefore, the objection to the overextension objection is not cogent.

Text. *Kim ca evam bādhonnītah api pakṣetaro nopādhih syāt vyatireke asādhāraṇyāt.* (308)

Tran. Moreover, in that case, even in the case of a countermanded mark "being other than the subject" would not be acceptable as an adjunct, for there would be the flaw of uniqueness in proving absence (of the probandum).

This is another reason for rejecting the above objection. Suppose one argues that fire is not hot because of being a product. Here not being different from fire is true only of fire, the inferential subject. Thus absence of "being other than fire" belongs only to the subject leading to the flaw of uniqueness. If the flaw of uniqueness disqualifies something from being an adjunct, bois cannot be an adjunct even in cases of countermanding. But the latter should be accepted as an adjunct as shown already.

Text. *Nanu bādhe na upādhi-niyamah dhūmena hṛade vahni-sādhane tadabhāvāt.* (308)

Tran. Objection (to the overextension objection): There is no rule that adjuncts are involved in cases of countermanded marks. For example, there is no adjunct in inferring (wrongly) that a lake has fire because of smoke.

It is here assumed that there is no fire in a lake. Then inferring that the lake has fire because of smoke is countermanded, for the probandum is known to be absent in the inferential subject. But the generalization that all smoky things are fiery is not at least overtly flawed by any adjunct (except some disputed ones). Further, it is also here assumed that the lake is without smoke so that the mark does not belong to the inferential subject. Since thus the inference is already known to be flawed, looking for an adjunct (the purpose of which is to show that the inference is flawed) is wasteful. Thus all countermanded marks do not involve adjuncts. So, given the charge of the flaw of uniqueness mentioned above, what is the harm if bois is not accepted as an adjunct in a case of a countermanded mark as well? The point of the objection continues in the next passage.

Text. *Na tu hetumati pakṣe bādhe pakṣetaropādhi-niyamah pratyakṣe vahnau kṛtakatvena anuṣṇatve sādhye atejastvaādeh upādhitva-sambhavāt iti cet.* (308–9)

Tran. It is not that bois is invariably an adjunct in countermanded marks that belong to the subject; indeed, in inferring that the perceived fire is not hot because of being a product, "not being fire" and so on are possible adjuncts.

In the previous case of countermanding the mark did not belong to the inferential subject (assuming that there was no smoke in the lake). What if the

mark does belong to the inferential subject in a countermanded case? One such example is inferring that a perceived fire is not hot because of being a product. Here the mark does belong to the inferential subject, for the perceived fire (is different, according to the Nyāya ontology, from fire atoms that are not products) is a product. Now take the property of "not being fire." Since all things that are definitely known not to be hot are different from fire, "not being fire" pervades the probandum. But "not being fire" does not pervade being a product, the mark, for there are products that are fires. Thus "not being fire" satisfies the given definition of an adjunct. But it is not an instance of bois. The latter is for this case "not being the perceived fire." Thus it is not true that bois is the only possible adjunct in such a case. So why admit it as an adjunct and invite the charge of uniqueness fallacy? [Phillips (56–57) reads the case differently to be the inference that fire is not hot because of being a product instead of the inference that the perceived fire is not hot because of being a product. In the reading of Phillips, "not being fire" is an instance of bois and then it is difficult to understand the point.]

Text. *Na. Tejomātrapakṣatve atejastvam vinā anyasya upādheh abāhvāt.* (309–10)

Tran. Reply (to the objection to the overextension objection): No, for there is no adjunct except "not being fire" if the intended inferential subject is "all fires."

In defense of the overextension objection attention is drawn to the following: take the case of inferring that all fires are without heat because of being products. Here "being other than all fires" or "not being fire" is an instance of bois that is the only available adjunct, the objector claims.

However, it may be noted that in this case the mark does not belong to the inferential subject as a whole (for some fires, viz., fire atoms, are not products) although it does belong to a part. So if the objector is right, what is shown is that in some cases of countermanding where the mark is not completely absent in the inferential subject bois is an adjunct, if any. Thus the objector does not address what would happen if in a case of countermanding the mark belongs to the inferential subject as a whole.

Further, the objector may not be right in claiming that no other adjunct is possible. Take the property of having weight. All fires have color that then is a feature of the inferential subject. Now change the probandum from "not being hot" to "being colored and not being hot" that is the probandum as restricted by a feature of the inferential subject. Since all things that are colored and not hot have weight, the latter pervades the restricted probandum, does not pervade the mark (for some products do not have any weight) and thus satisfies the given account of an adjunct if restricted probanda are permitted [*Anyasya upādheh abhāvāt iti yathāśrutam tu na samgacchate vyatireke asādhāraṇya-*

ābhāvavatah api gurutvādeh rūpavattva-avacchinna-sādhya-vyāpakatayā upādhitvāt, MN 309–10].

Text. *Kim ca parvata-avayava-vṛtti-anyatvam parvata-itara-dravyatvam hṛada-parvata-samyoga-anādhāratvam hṛada-parvata-anyatvādikam upādhih syāt eva vyatireke asādhāraṇya-abhāvāt vyatirekina sat-pratipakṣa-sambhavāt ca. Na ca asādhāraṇyam, tasya api sat-pratipakṣa-utthāpakatayā doṣatvāt.* (310–11)

Tran. Another reply (to the objection to the overextension objection): Moreover, "being other than what resides in parts of the hill," "being a substance other than the hill," "not being the locus of the contact between the lake and the hill," "being different from the hill and the lake" and so on turn out to be adjuncts, for there is no (flaw of) uniqueness in proving absence and the counterinference (of absence of the probandum in the inferential subject) from absence (of the adjunct) is possible. (The flaw of) uniqueness is not there and these are flaws by way of promoting the counterinference.

The defender of the overextension objection offers a more promising response. The status of bois as an adjunct was questioned on the ground that its absence fails to be a probans for inferring absence of the probandum because of the flaw of uniqueness. Now he argues that other similar features that do not suffer from the said flaw turn out to be adjuncts in the light of the given account. The first specimen, viz., "being other than what resides in parts of the hill," could of course be intended to mean "being other than the hill," for the hill as a substantial whole (*avayavin*) resides in its parts (*avayava*) in the relation of inherence (*samavāya*). However, universals like substanceness too reside in parts of the hill in the relation of inherence. [That the relation between a substantial whole and its parts is the same as that between a universal and its instances or that between qualia and substances and so on is one of the great insights of ontological economy that emerged early in the Nyāya-Vaiśeṣika metaphysics. The same relation does not obliterate relevant differences that can be explained with the help of specifiers (*avacchedaka*).] Since these do reside in parts of the hill, they are not other than what reside in parts of the hill. But these are also present in a lake, say, where there is absence of the probandum fire (in the sound inference of fire in the hill from smoke). Thus the flaw of uniqueness does not arise. Similar remarks apply, *mutatis mutandis*, to the other cited features in the text as well. This shows that appealing to the fallacy of uniqueness does not resolve the difficulty from properties like bois, for other similar properties avoid the flaw of uniqueness and still lead to the difficulty.

Text. *Tasmāt ubhayorapi vyāpti-grāhaka-sāmye virodhāt na vyāpti-niścayah, kintu ubhayatra vyabhicāra-samśayah, tathā ca vyabhicāra-samśaya-*

ādhāyakatvena upādheh dūṣakatvam, tat ca pakṣetare api asti; taduktam upādhereva vyabhicāra-śamkā iti. (311–12)

Tran. Therefore, since the grounds of both generalizations are equivalent and since there is opposition, the generalizations are not certain; rather there is apprehension of deviation with reference to both. Thus an adjunct is a flaw by way of providing the ground for having the doubt that a generalization may be false. But that applies to "being other than the subject" as well. Indeed, it is said (by Udayana) that an adjunct for sure leads to fear of deviation.

This is an argument in favor of the overextension objection. The two generalizations mentioned in the text are (1) that the mark is pervaded by the probandum and (2) that the probandum is pervaded by the adjunct. There is conflict, because being pervaded by the probandum and not being pervaded by that which pervades the probandum are incompatible. Similarly, pervading the probandum and not pervading what is pervaded by the probandum are incompatible [*Ubhayoh sādhya-sādhnayoh sādhyopādhyoh, virodhāt iti virodhah sādhyavyāpyatva-sādhyavyāpakavyāpyatvayoh sādhyavyāpakatva-sādhyavyāpyavyāpakatvayoh*, MN 312–13]. The two inconsistent sets may be stated as below by letting A, M and P stand for respectively the adjunct, the mark and the probandum.

(1) All M is P.
All P is A.
Some M is not A.

(2) All P is A.
All M is P
Some M is not A.

The only difference between the two sets is the order in which the first two propositions are stated; this difference in the order is immaterial for logical inconsistency. So it suffices to look at the first set. "All M is P" and "all P is A" imply (by the rule of transitivity of class inclusion) that "all M is A." But it is asserted that "some M is not A." "All M is A" and "some M is not A" are contradictory and cannot be true together. [This passage shows that logical inconsistency is explicitly recognized by Nyāya logicians. Nyāya logic is not merely formal logic. But the Nyāya does have the resources to recognize and rigorously express formal relations among cognitive contents (that play the role of propositions) as and when that is useful to make a philosophical point.]

Needless to say, the inconsistency suffices to cast doubt on both generalizations. Thus an adjunct is a flaw by way of providing a ground for fear of de-

viation. Since bois too provides that ground, it too should be recognized as an adjunct—so goes the argument.

> Text. *Bhavatu vā ukta-nyāena sakala-anumāna-bhañga-bhiyā pakṣetarah anupādhih, tathāpi lakṣṇam ativyāpakam*. (312)

> Tran. Objection: Or, because of the fear of elimination of all inferences for the said reason, let "being other than the subject" not be accepted as an adjunct. Reply: Still the definition is too wide.

If all inferring is faulty, bois too fails to show absence of the probandum from absence of the adjunct. Hence it should not be recognized as an adjunct, the objector says. But even then the account of an adjunct given earlier remains too wide, for the said account remains applicable to bois—such is the reply. What if we add the qualification of being devoid of any qualifier that is not necessary for stopping deviation? As we have seen, the inclusion of the subject in bois is needed for preventing the mark from failing to belong to the subject and not for preventing deviation. But even then take the inference that originated atoms (things that are very small) have a causal agent because of being products. Here bois amounts to "being other than originated atoms." In this case the inclusion of originated atoms is necessary for preventing deviation, for unoriginated atoms do not have a causal agent [*Na ca vipakṣa-avyāvarttaka-viśeṣaṇa-anavacchinneti-viśeṣaṇa-dānāt eva na ativyāptih iti vācyam. Tathā api janya-anavah sakartṛkah kāryatvāt ityādau anubhinnādau pakṣetare ativyāpteh tatra anuviśeṣaṇena vipakṣasya paramāṇoh api vyāvarttanāt*, MN 313]. Thus the said account is too wide even when the further qualification is added.

> Text. *Nāpi sādhya-sama-vyāptatve sati sādhana-avyāpakatvam upādhitvam, dūṣakatā-bījasya vyabhicāra-unnayanasya sat-pratipakṣasya vā sāmyena viṣama-vyāptasya api upādhitvāt tathā dūṣakatāyām sādhya-vyāpyatvasya aprayojakat-vat ca*. (312–13)

> Tran. Not also that an adjunct is that which is coextensive with the probandum and that which does not pervade the mark. Since the reason why it is a flaw, viz., that it shows deviation or provides for a counterinference (of absence of the probandum), applies equally to something non-coextensive (*viṣama-vyāpta*) as well, the latter too is an adjunct; indeed, "being pervaded by the probandum" is superfluous in so far as (an adjunct) serves as a flaw in the said way.

Take the example of inferring smoke from fire in which wet fuel is an adjunct. All smoky things have wet fuel and the adjunct pervades the probandum. All things with wet fuel are also smoky; so the probandum pervades the adjunct. Thus, the adjunct and the probandum are coextensive. The adjunct

still does not pervade the mark, for a hot iron is fiery but without wet fuel. So the suggestion is that the definition of an adjunct should be modified: an adjunct is what is coextensive with the probandum and does not pervade the mark. The definition then does not overextend to bois, for the latter is not coextensive with the probandum: in the inference that the hill is smoky because of fire, a hot iron is other than the subject, viz., the hill, but is not smoky.

The suggestion is rejected. An adjunct is a flaw by way of showing deviation or providing for a counterinference (of absence of the probandum in the inferential subject from absence of the adjunct in the inferential subject). This test can be met equally by something that is not coextensive with the probandum: something that is not coextensive and fits the said description can still show deviation from the probandum on the ground of deviation from itself and also show absence of the probandum on the ground of its own absence [*Sva-vyabhicāreṇa sādhya-vyabhicāra-unnāyakatayā sva-vyatirekeṇa sādhya-vyatireka-unnāyakatayā*, MN 313]. So something that is not coextensive should also be accepted as an adjunct. Thus, the requirement of being coextensive appears to be ad hoc and added merely to avoid the difficulty of overextension to bois. Further, by leaving out those that are not coextensive and still fits the said description the definition becomes too narrow.

Moreover, being coextensive includes a redundant (*aprayojaka*) condition. To say that an adjunct is coextensive with the probandum is to say both (1) that the adjunct pervades the probandum and (2) that the latter pervades the former. The second is redundant for showing deviation or casting doubt on pervasion. So it should be dropped and then overextension to bois is an issue.

The said redundancy can be seen (by adopting the same symbols as above) as follows.

(1) All P is A.
Some M is not A.
Therefore, some M is not P

(2) All A is P.
All P is A.
Some M is not A.
Therefore, some M is not P.

Both are valid arguments but (2) contains the redundant premise that "All A is P."

Again, the above passage shows that the Nyāya has the resources to express formal relations like coextension, non-coextension and so on and is sensitive to redundancy in a valid argument. [Obviously the Nyāya is not limited to

merely formal logic. Redundancy is not a concern in merely formal logic. Also, the topic of generalization (*vyāpti-graha*) and its reliability, including the discourse on adjuncts, falls outside the domain of merely formal logic. Still formal relations are recognized when they are useful for the matter in hand.]

Text. *Atha sādhya-prayojako dharma upādhih prayojakatvam ca na nyūna-adhika-deśa-vṛtteh tasmin satyabhavatah tena vināpi bhavatah tat-aprayojakatvāt, anyathā pakṣetarasya api upādhitva-prasañga iti cet.* (313–14)

Tran. Objection (to overextension objection): An adjunct is a feature that has a necessary link with (*prayojaka*) the probandum; the necessary link is from lack of presence that is either too wide or too narrow; hence that which is absent in spite of the presence of the other and that which is present in spite of the absence of the other is not a necessary link. Otherwise, "being other than the inferential subject" too turns out to be an adjunct.

The objector gives another reason to rule out features that are not coextensive. He argues that an adjunct has a necessary link with the probandum. Necessary link is not possible without coextension. If something is absent where something is present or if something is present where something is absent, the former is not necessarily linked with the latter. So exclusion of what is not coextensive is not ad hoc but based on a reason. This also has the benefit of avoiding overextension to bois that is not coextensive with the probandum [*Viṣama-vyāpakasya pakṣtaratvādeh api upādhitvāpātāt. Tathā ca prāguktam sādhya-sama-vyāpta-hetu-ityādi-lakṣaṇam samyak eva iti āśayah*, JD 524].

[The word *prayojaka* is derived from the verb *yuj* that means linking or uniting. The prefix *pra* means excellence (*prakṛṣṭatva*). Thus the word *prayojaka* literally means what excellently links or unites and may be interpreted in the present context to mean necessary link or union. This word is also used in other technical senses in the Nyāya literature.]

Once again, the above passage shows that the Nyāya has at its disposal concepts like *prayojaka* that are explained in formal and extensional terms.

Text. *Na. Dūṣaṇaupayikam hi prayojakatvam iha vivakṣitam tat ca sādhya-vyāpakatve sati sādhana-avyaāpakatvam eva iti, tadeva prayojakam na tu adhikam vyarthatvāt.* (314)

Tran. Reply: No. The intended necessary connectedness here is for sure being the basis of the flaw; and that is without doubt being pervasive of the probandum and not being pervasive of the mark; that alone is the (relevant sense of) necessary connection and not the one with the addition (of being pervaded by the probandum), for the latter is superfluous.

The above argument is rejected. An adjunct is so called because it falsifies or provides for a counterinference in the said way. That task is fulfilled if something pervades the probandum and does not pervade the mark. The additional requirement of both pervading the probandum and being pervaded by the probandum is not needed for that task. So, being superfluous, it should not be included in the account. Then there is overextension to bois.

> Text. *Nanu upādhih sa ucyate yaddharmah anyatra prativimbate, yathā japa-kusumam sphatika-lauhitya upādhih, tathā ca upādhi-vṛtti-vyāpyatvam hetutvābhimate cakāsti tena asau upādhih. Na ca vyāpyatva-mātreṇa dūṣkatvamiti sādhya-vyāpakatā api iṣyate, tathā ca sama-vyāpta eva upādhih iti cet*. (314–16)

> Tran. Objection (to overextension objection): When a feature of something is transferred to another thing, it is called an adjunct (e.g., a red flower is an adjunct for the red color of a crystal). In the same way, the feature of being pervaded (by the probandum) that belongs to an adjunct is transferred to that which is taken to be a mark; this is why it is an adjunct. However, it cannot be the flaw merely by way of being pervaded (by the probandum); hence being pervasive of the probandum is also intended. Thus what is coextensive (with the probandum), indeed, is an adjunct.

One more argument is offered for rejecting features that are not coextensive (and by implication rejecting the charge of overextension to bois). The objector draws attention to a familiar meaning of the term *upādhi* or adjunct. According to this widely known usage, something is literally called an adjunct if its feature is mirrored in another thing [*Anya-dharmika-sva-dharma-prativimba-janakatvasya yaugikatvam vyaktikaroti*, JD 525]. For example, a crystal that is not actually red looks red because of the red color of an adjacent red flower. Here the latter is called an adjunct, for one of its features, viz., the red color, is transferred to the former. Similarly, something is said to be an adjunct with reference to a mark. The basis of that is that the pervadedness (*vyāpyatva*) of the adjunct is transferred to the mark that is not actually pervaded. However, pervadedness alone is insufficient as the basis of the said flaw. So pervasiveness (*vyāpakatva*) is added to provide the sufficient basis and that amounts to coextension.

In this connection GD remarks as follows: this analysis of the term *upādhi* is for showing that something non-coextensive is not the intended target of the definition (of an adjunct) and that the qualifier of being pervaded by the probandum in the said definition is useful [*Upādhi-pada-vyutpādanam viṣama-vyāpakasya alakṣyatā-sampādakatayā pūrvokta-lakṣaṇe sādhyavyāpyatva-viśeṣaṇa-sārthakya-upapādakam*]. Something non-coextensive lacks the feature that provides the ground of the usage of "adjunct"; that

feature is transference of its pervasion; this is obtained from the derivation (of "adjunct") [*Viṣama-vyāptasya . . . avayava-artha-anvaya-labhya-sva-nisṣṭha-vyāpti-samkrāmakatva-rūpa-upādhi-vyavahāra-viṣayatā-prayojaka-dharma-abhāvam*]. The derivational meaning of *upādhi* is that it is something a feature of which is transferred to another adjacent thing [*Yasya dharmah samīpavartini svabhinne bhāsate*, GD 914].

It is pointed out above that pervadedness alone does not suffice for the ground of the said flaw. It is implied that if something is pervaded by the probandum and does not pervade the mark, it does not necessarily show deviation from the probandum. This may be explained below with the same symbols as before.

All A is P
Some M is not A.
Therefore, some M is not P.

Here P is distributed in the conclusion as the predicate of a particular negative (O) proposition but not in the premise as the predicate of a universal affirmative (A) proposition. Hence the argument is invalid. The above passage shows that such formal invalidity is being noted by Naiyayikas. It is also noted that invalidity is removed by adding pervasiveness. This is explained below.

All A is P.
All P is A.
Some M is not A.
Therefore, some M is not P.

Since P is now distributed not only in the conclusion but also in a premise, the argument is valid. It now has a redundant premise as noted earlier. However, that does not make the argument invalid and so the objector is not disallowing that. This shows that the Nyāya is not only taking note of formal invalidity but also of how the invalid argument is transformed into a valid one.

Text. *Tat kim viṣama-vyāptasya dūṣakatā-bīja-abhāvāt na upādhi-śabda-vācyatvam tathātve api upādhi-pada-pravṛtti-nimitta-abhāvāt vā , na ādyah vyabhicāra-unnāyakatvāt, na aparah na hi loke sama-vyāpta eva anyatra sva-dharma-prativimba-janaka eva upādhi-pada-prayogah, lābhādyupādhina kṛtam ityādau lābhādau api upādhi-pada-prayogāt*. (316–17)

Tran. Reply: Is it that something non-coextensive is not a referent of the word "adjunct" because it does not provide the ground of the flaw or is it that in spite of that it lacks the ground of the application of the term "adjunct"? Not the first, for it shows deviation. Not the other. It is not that only that which is coextensive and transfers its feature to something else is called an adjunct in ordinary usage,

for in such usage as "enough of the need of profiteering" the term "adjunct" is also used for profit and so on.

Since something non-coextensive too provides the ground of the flaw, it should be called an adjunct. Second, the word adjunct is used in more than one way. So appeal to ordinary use does not justify restricting the word to only something coextensive.

Text. *Kim ca na śāstre laukika-vyavahāra-artham upādhi-pada-vyutpādanam kintu anumāna-dūṣaṇa-artham, tat ca sādhya-vyāpakatve sati sādhana-avyāpakatva-mātram iti śāstre tathā eva upādhi-pada-prayogah*. (317)

Tran. Moreover, in (this) systematic study the goal of the analysis of the term "adjunct" is not clarification of ordinary usage but (understanding) a flaw of inferring; and that is only pervading the probandum and not pervading the mark; hence in (this) systematic study the term "adjunct" is used thus only.

The reply continues. Though it is often useful to study the ordinary use of a term, sometimes a term may be used in a technical sense, it is remarked by way of reply, in a systematic study and such technical sense may or may not fit ordinary use. Such is the case with the term "adjunct." In the present systematic study of flaws of inferring "adjunct" stands for a flaw that is sufficiently explained as pervading the probandum and not pervading the mark. Hence additional conditions should not be brought in.

Text. *Anye tu yadabhāvo vyabhicāra-virodhi sa upādhih. Na ca viṣama-vyāptasya abhāvo vyabhicāram viruṇaddhi, tasya abhāve api vyabhicārāt. Asti hi anityatva-vyāpakam prameyatvam tadvyāpyam ca guṇatvam. Na ca anityatva-guṇatvayoh vyāptih asti, sama-vyaāptikasya ca vyatirekah tathaā, na hi sādhya-vyāpaka-vyāpyībhūtasya vyāpyam yat tat sādhyam vyabhcarati, vyabhicāre ca antatah sādhyam eva upādhih, abhede api vyāpya-vyāpakatvāt sādhana-avyāpakatvāt ca iti svīcakruh*. (317–20)

Tran. Objection (to overextension objection): Others hold that an adjunct is that the absence of which is opposed to deviation. But absence of something that is not coextensive is not opposed to deviation, for there is deviation in spite of absence of that. Thus knowability pervades non-eternality (i.e., all non-eternal things are knowable) and that pervades being a quale (i.e., all qualia are knowable), but there is no pervasion between being non-eternal and being a quale (i.e., some non-eternal things are not qualia; alternatively, some qualia are not non-eternal). However, absence of something coextensive is that way (i.e., opposed to deviation from the probandum). It is not that what is pervaded by what is pervaded by what pervades the probandum deviates from the probandum, and in case of deviation at least the probandum itself would be an adjunct, for in the

case of nondifference also there would be pervasion of the pervaded and lack of pervasion of the mark.

This is another attempt (suggested by Sondada, GD 916) to disallow something non-coextensive as an adjunct (and avoid the charge of overextension to bois). An adjunct is now defined as that the absence of which is opposed to deviation. That is, an adjunct is that the absence of which necessitates absence of deviation. By deviation is meant deviation from the probandum. Thus it may be said that an adjunct is that the absence of which is coextensive with absence of deviation from the probandum [*Sādhya-vyabhicāra-virodhi sādhya-vyabhicāra-abhāva-samaniyatah*, MN 318]. For example, (in inferring smoke from fire) fire from wet fuel is something absence of which is coextensive with absence of deviation from smoke, the probandum: if there is absence of fire from wet fuel, there is absence of smoke, the probandum, and if there is smoke, the probandum, there is fire from wet fuel. However, wet fuel is not coextensive with smoke; there may be wet fuel without smoke. Hence, although wet fuel pervades smoke, smoke does not pervade wet fuel. Thus if something non-coextensive is accepted as an adjunct, both its presence and absence is compatible with absence of the probandum and so only something coextensive should be an adjunct.

It is remarked that if something is pervaded by something that is pervaded by something that pervades the probandum, then the former does not deviate from the probandum. This may be explained as below.

All P is A.
All B is A.
All C is B
Therefore all C is P.

This is formally invalid. Let P, A, B and C be respectively horse, animal, carnivore and lion. It is true that all horses are animals, that all carnivores are animals and that all lions are carnivores but it is false that all lions are horses. If two classes are both included in another class, it does not follow that the former two classes are mutually pervasive or one is included in the other. The formal fallacy is known as undistributed middle in medieval European logic.

It should not be held that Gangesa himself subscribes to this invalid form, for the latter appears in an aporetic passage attributed to "another (*anya*)" thinker. Further, Gangesa expresses his own reservation in the immediately following passage that we take up next. It does not also follow that the invalid form should be attributed to the other thinker, for the following counterexample is provided in the aporetic passage.

All non-eternal things are knowable.
All qualia are knowable.
But it is not that all non-eternal things are qualia.
(Or it is not that all qualia are non-eternal.)

Both that all non-eternal things are knowable and that all qualia are knowable are accepted in the Nyāya. But that all non-eternal things are qualia is not accepted. [Whether all qualia are non-eternal is a matter of controversy, for some accept eternal qualia.] Since the counterexample is there, the invalid form may have been stated to draw our attention to it and help us get a better understanding of the right formula (to the extent such rare help can be expected from Gangesa who writes compactly and takes the oral tradition for granted). [Our reading is consistent with that of MN who interprets knowability as being the qualificand of the reliable awareness of a non-eternal quale: *prameyatvam anityaguṇavitipramāviśeṣyatvam*, MN 321. If the point of the above text is analyzed in our way, there is no need to give any forced interpretation.]

Text. *Tat na. Tava api hi avyabhicāre sādhya-vyāpya-vyāpyatvam tantram āvaśyakatvāt lāghavāt ca na sādhya-vyāpaka-vyāpyatvam api bhavatā eva vyabhicārasya darsītatvāt*. (320–21)

Tran. Reply: That is not accepted. For you too the relevant factor for nondeviation is being pervaded by what is pervaded by the probandum, for that is necessary and economical (as distinguished from the condition of coextensiveness that is neither necessary nor economical, GD 925); (the relevant factor) is not being pervaded by what pervades the probandum, for you yourself have shown the counterexample.

The above reason for disallowing something non-coextensive is rejected. The proper basis for nondeviation is not being pervaded by what pervades the probandum. The said counterexample from non-eternality, knowability and being a quale shows that. The proper basis of nondeviation is being pervaded by what is pervaded by the probandum, for class inclusion is transitive. That is, it is not possible that something is pervaded by what is pervaded by the probandum and that something also deviates from the probandum. Formal generality is achieved in the Nyāya sometimes by the use of pronominal variables (that are sometimes left understood) and the use of general concepts like "probandum" that may be replaced by concrete terms.

This passage shows again that although the Nyāya is not merely formal logic, valid forms are distinguished from invalid forms and invalidity is explained by providing a counterinterpretation that makes the premises acceptable but not the conclusion. This is exactly the point of the counterexample from non-eternality, knowability and being a quale.

Text. *Na ca sādhya-vyāpya-vyāpyatvam eva anaupādhikatvam, sādhya-vyāpyam ityatrāpi hi anaupādhikatvam tadeva vācyam tathā ca anavasthā iti, anaupādhikatve ca vyāpti-lakṣaṇe yāvat iti padam sādhya-vyāpakatve viśeṣaṇam dattam eva.* (321–22)

Tran. It is not also that "being devoid of adjuncts" is the same as "being pervaded by what is pervaded by the probandum." Being pervaded by the probandum too must be said to be devoid of adjuncts and then there is infinite regress. Indeed, with reference to the definition of pervasion as being devoid of adjuncts it is necessary to add the qualifer "all" or "whole" (*yāvat*) to "pervading the probandum" (i.e., since an adjunct should pervade all probanda, there is threat of infinite regress).

If "being devoid of adjuncts" is explained in the said way, since being pervaded by the probandum is contained there and the latter too involves being devoid of adjuncts, infinite regress results and so that is not acceptable.

Text. *Kim ca yasmin sati anumitih na bhavati tadeva tatra dūṣaṇam na tu yadvyatireke bhavati eva iti etadgarbham, viruddhatvādeh api adoṣatva-āpatteh.* (322–23)

Tran. Moreover, that the presence of which prevents an inference is a flaw with reference to that and not that that in the absence of which (inference) always happens (is a flaw with reference to that), for then the contradictory and so on too would turn out not to be flaws.

This is one more objection to the above view that an adjunct is that absence of which is opposed to deviation. An adjunct is a flaw because its presence prevents an inference from being sound. This is also true of other flaws, such as being contradictory. But the absence of a flaw does not guarantee a sound inference. For example, a contradictory mark is that which is never co-located with the probandum. A mark that is sometimes co-located with the probandum is not a contradictory mark; thus in that case there is absence of the flaw of being contradictory. But that does not guarantee that the inference is sound, for that mark may still be co-located with absence of the probandum and be deviant. Similarly, presence of an adjunct does guarantee deviation; but absence of an adjunct does not guarantee absence of deviation.

It may be noted that for some flaws absence of the flaw implies necessarily fulfilling the corresponding condition for soundness of an inference. For example, absence of the flaw of not belonging to the inferential subject (wholly or in part) implies belonging to the inferential subject [*Yadvyatireka iti. Yadvyatireke anumiti-prayojakam rūpam vyāptyādyanyatamam bhavati eva, yathā asiddhi-vyatireke siddhih*, RS in GD 924]. But this does not hold of deviation or contradictoriness. A mark that is not deviant may still be contradictory and

a mark that is not contradictory may still be deviant [*Viruddhatvāde iti. Vipakṣamātragāmitva-sapakṣavipakṣagāmitvalaksaṇa-virodha-vyabhicārayoh ekaikavirahe api vyāpteh aniyamāt*, RS in GD 924].

Text. *Nāpi pakṣa-dharma-avacchinna-sādhya-vyāakatve sati sādhana-avyāpakatvam upādhitvam sādhana-avacchinna-sādhya-vyāpaka-upādhi-avyāpanāt. Śabdah abhidheyah prameyatvāt ityatra aśrāvaṇatvasya upādhitva-āpatteśca śabda-dharma-guṇatva-avacchinna-abhidheyatvam yatra rūpādau tatra aśrāvaṇatvam vyāpakam pakṣe prameyatvasya sādhanasya avyāpakam hi tat. Ārdrendhanavatvādau upādhau pakṣa-niyata-tādṛśa-dharma-abhāvāt ca.* (323–24)

Tran. It is not also that an adjunct is that which pervades the probandum as specified by a feature of the inferential subject and does not pervade the mark, for then (the definition) fails to apply to an adjunct that pervades the probandum as specified by the mark. Further, then there is the consequence that inaudibility turns out to be an adjunct in the inference that sound is nameable because it is knowable: indeed, inaudibility pervades color and so on that are nameable and also specified by qualeness (i.e., are qualia) where qualianess is a feature of sound, the subject (i.e., although all nameable things are not inaudible, all undisputed nameable qualia are inaudible: sound is the subject and so left out of the range of confirming instances to avoid the charge of begging the question) and also does not pervade knowability, the mark, that is present in the inferential subject (where inaudibility is absent, sound being audible). Moreover, in such cases as being possessed of wet fuel and so on there is lack of such a feature that specifically belongs to the inferential subject.

Three objections are raised against the new definition that an adjunct is that which pervades the probandum as specified by a feature of the inferential subject and does not pervade the mark. First, the case of pervading the probandum as specified by a feature of the inferential subject is different from that of pervading the probandum as specified by the mark (as explained earlier), so the definition does not apply to the latter and suffers from undercoverage.

It may be noted that both of these two kinds of adjuncts may be found in the same false inference (e.g., the pot is perceptible because of being an eternal substance). Here being a self (*ātmatva*) is an adjunct that pervades the probandum as specified by the mark—that is, although being a self does not pervade the original probandum of being perceptible, it does pervade all eternal substances that are perceptible (in accordance with Nyāya ontology). On the other hand, having perceptible touch is an adjunct that pervades the probandum as specified by being an externally perceptible substance that is a feature of the inferential subject—that is, having perceptible touch does not

pervade the original probandum of being perceptible (since internal states like pleasure, for example, are perceptible but lack perceptible touch); still, having perceptible touch pervades all externally perceptible substances [*Ghatah pratyakṣo nityadravyatvāt . . . sādhana-avacchinna-sādhya-vyāpakam ātmatvam pakṣadharma-avacchinna-sādhya-vyāpakam . . . pratyakṣa-sparśa-āśrayatvam . . . upādhih*, RS in GD 927].

Second, an adjunct then appears in the sound inference that sound is nameable because it is knowable. Since sound is classified as a quale in the favored ontology, qualeness is a feature that specifically belongs to sound, the subject. Thus nameable qualia are the probanda as specified by a feature of the subject in this case. All nameable qualia (except sound) are inaudible in the Nyāya ontology. But all knowable things are not inaudible, for sound is knowable and not inaudible. Thus inaudibility fits the above definition and that makes it too wide.

MN observes that this overcoverage is epistemic (*jñāna-ativyāpti*) and not overcoverage as a matter of fact (*vastu-ativyāpti*). As a matter of fact in the light of the accepted ontology, inaudibility does not pervade nameability, for sound is nameable and not inaudible. Although as a matter of fact the adjunct does not belong to sound, the subject, that does not prevent it from pervading the probandum as specified. For the presence of the probandum in the subject is under investigation; the anticipated deviation from failure to belong to the subject does not suffice to obstruct the generalization since the adjunct does belong to everything where the probandum as specified is known with certainty to be present. Otherwise no such adjunct that does not belong to the subject where the presence of the probandum is under inquiry could be known to pervade the probandum [*Jñāna-ativyāptim āha, śabda iti, . . . pakṣe sādhya-avyāpakatayā vastu-ativyāpteh abhāvāt. . . . Na ca pakṣe vyabhicāra-jñāna-sattvena katham tatra rūpādau sādhya-vyāpakatva-niścaya iti vācyam. Sandigdha-sādhyaka-pakṣa-avṛtti-upādhi-mātrasya sādhya-vyāpakatva-niṣcaya-uccheda-āpattyā pakṣīya-sādhya-sandeha-āhita-vyabhicāra-sandehasya sādhya-vyāpakatā-niścaya-aparipanthitvāt*, MN 325–26].

Third, in some cases the subject is not possessed of an appropriate specific feature. For example, take the false inference that the lake has smoke because of fire with respect to which inference wet fuel is an adjunct. Here the inferential subject lake does not have the requisite kind of specific feature that is relevant for such an adjunct.

Text. *Atha sādhana-avacchinna-sādhya-vyāpakatve sati sādhana-avyāpakah upādhih tena dhvamsasya janyatvena dhvamsa-pratiyogitve sādhye sādhana-avacchinna-sādhya-vyāpakam bhāvatvam upādhih śyāmatve śāka-pākajatvam upādhih iti.* (324–25)

Tran. An adjunct is that which pervades the probandum as specified by the mark and does not pervade the mark. Then being positive becomes an adjunct in inferring that destruction is destructible because of being originated and being due to the consumption of certain vegetables becomes an adjunct in inferring dark complexion.

This is another attempted definition of an adjunct. Instead of speaking of the probandum as specified by a feature of the subject, it speaks of the probandum as specified by the mark. Take the inference that destruction is terminal because of being originated. In the light of Nyāya ontology all terminal things are not positive reals; prior absence (*prāgabhaāva*) is terminal but is not a positive real. So being positive (*bhavatva*) does not pervade being terminal, the probandum. However, in the light of Nyāya ontology all originated terminal things are positive entities (prior absence has no beginning). Thus being positive pervades the probandum as specified by being originated, the mark. All originated things are also not positive, for destruction has an origin but is not positive. So being positive does not pervade originatedness, fits the said account of an adjunct showing that the inference is flawed. The other example of an adjunct, viz., being due to consumption of certain vegetables in inferring dark complexion, has been explained earlier.

Text. *Tat na, pakṣa-dharma-avacchinna-sādhya-vyāpaka-upādhi-avyāpanāt, jalam prameyam rasavattvāt ityatra rasavattva-avacchinna-sādhya-vyāpaka-prthivitvasya upādhitva-prasañgāt sopādhitvāt asādhakam ityatra sādhana-avacchinna-sādhya-vyāpaka-vyabhicāritve sādhana-avacchinna-ityasya vyarthatva-prasañgaāt ca*. (325–27)

Tran. That is not accepted. It fails to apply to an adjunct that pervades the probandum as specified by a feature of the inferential subject. It involves as a consequence that earthness that pervades the probandum as specified by possession of taste is an adjunct in the (sound) inference that water is knowable because of possession of taste. There is also this consequence: when (a mark) fails to prove because of having an adjunct, with reference to deviation from that which pervades the probandum as specified by the mark, the part "specified by the mark" is superfluous.

Three objections are raised, the first of which is obvious. The point of the second objection is that earthness does not pervade knowability, the original probandum. But all undisputable knowable things with taste are of the earth type; thus earthness appears to pervade the probandum as specified by the mark. [The exception provided by water does not count, for water is the inferential subject.] The overcoverage involving earthness is again of the epistemic type (explained above) and not as a matter of fact, for the adjunct is actually

absent in the inferential subject to which the probandum (that happens to be an omnilocated property) belongs as a matter of fact. But that does not suffice to avoid the overcoverage, for the inferential subject needs to be left out of the account for the time being or bracketed (as Phillips appropriately puts it) to avoid the charge of begging the question.

Third, take the inference that possession of fire is not a proper probans for smoke because of involving an adjunct. Here adding the further qualification of the probandum being specified by the mark is superfluous, for the fault is with reference to the original or unspecified probandum itself. That is, not all adjuncts are faults by virtue of pervading the restricted probandum. There are also adjuncts that are faults by virtue of pervading the original probandum.

There is another way of seeing this objection. Take the meta-inference that a mark fails to prove (*asādhaka*) because of involving an adjunct (*sopādhitvāt*). This meta-inference may be reformulated as that a mark fails to prove because of involving something that pervades the probandum and does not pervade the mark. Here failing to prove follows from involving something that pervades the probandum and does not pervade the mark. Adding the further qualification about the probandum as specified by the mark is uncalled for.

Text. *Kim ca pakṣa-dvaye api viśiṣṭa-sādhya-vyabhicāram viśiṣṭa-sādhya-vyatirekam vā prasādhya paścāt kevala-sādhya-vyabhicārah kevala-saādhya-vyatireko vā sādhanīyah tathā ca arthāntaram kevala-sādhye hi vivādo na tu viśiṣṭe. Atha prakṛta-sādhya-vyabhicāra-siddhyartham viśiṣṭa-sādhya-vyabhicārah sādhyah iti cet. Na, apraptakālatvāt.* (327–28)

Tran. Moreover, in both cases even after showing deviation from or absence of the probandum as specified the deviation from or absence of the probandum alone needs to be shown; then there is the flaw of change of the subject matter (*arthāntara*); the debate is over the probandum alone and not over (the probandum) as specified. Objection: deviation from the probandum as specified is to be shown for the sake of deviation from the probandum proper. Reply: No, for it is not the appropriate occasion.

This objection (to which Gangesa has more to say in reply later) applies irrespective of whether an adjunct is defined as that which pervades the probandum as specified by the mark or as that which pervades the probandum as specified by the nature or a feature of the inferential subject. That the adjunct pervades the probandum does not follow from that the adjunct pervades the probandum as specified, for the extension of the probandum as specified is smaller than that of the probandum. Hence that the mark is deviant does not follow even if the adjunct fails to pervade the mark and does pervade the probandum as specified. To show that the mark is flawed it is necessary to show

then that the adjunct pervades the probandum and not merely that the adjunct pervades the probandum as specified. Thus showing that the adjunct pervades the probandum as specified amounts to arguing for what is not the subject matter at hand. [The NS 5.2.7 and the comments of Vatsyayana thereon explain the flaw of changing the subject matter as a ground of defeat in a debate. In Gangesa's own writing another alleged example of this flaw is found in the chapter on inherence (*samavāya*) where the argument for inherence is criticized (mistakenly in the view of Gangesa) for being a proof of something else called self-linking relation (*svarūpa-sambandha*).]

One could object that although deviation from the probandum does not follow directly from deviation from the probandum as specified, it may still follow indirectly; so it may still be useful to show deviation from the probandum as specified and, therefore, there may be no flaw of changing the subject matter [*Paramparayā prakṛtopayogāt na arthāntaram*, MN 329]. The critic disagrees, for the probandum as specified is not the intended (*ākāmkṣita*) probandum. The flaw of inappropriate occasion (*aprāptakālatva*) is due to that—that is, due to being about something that is not intended (*anakamksitatva-rupa-aprāptakālatva*, GD 935; *aprāptakālatvāt iti, prathamam viśiṣṭasādhya-vyabhicārasya anākāmkṣitasya abhidhānāt*, MN 329).

[While offering his response later Gangesa may not seem to address the charge of inappropriate occasion. Does Gangesa then apparently forget about the charge of inappropriate occasion? Not necessarily. If the charge is analyzed following the leads of GD and MN and so on, the response of Gangesa does address the charge, as we shall see. On the other hand, the charge may be understood as that of the wrong order of steps deviating from the recommended order of steps in a pentapod argument (*pañcāvayava-nyāya*) as laid down in the NS 5.2.11 and Vatsyayana's comments thereon. Gangesa does not explicitly respond to that. This may not be due to his forgetting about the charge. Rather, this may be due to the fact that an argument may be sound even if the steps are in a wrong order, so that there is no major harm if the charge is not refuted. Indeed, the recommended order of steps in a pentapod argument is primarily for reducing the risk of miscommunication between the proponent and the opponent in a debate and is concerned with rhetoric. It should also be kept in mind that because of the continuity of the oral tradition Gangesa does leave some things understood that he expects the teacher to supply for the benefit of the student. So his omission need not imply forgetfulness.]

Text. *Prathamam sādhya-vyabhicāra eva udbhāvyah tatra asiddhau upādhiriti cet. Tarhi prakṛtānumāne na upāhih dūṣaṇam syāt. Kimca sādhya-vyabhicāra-hetutvena pakṣa-dharma-avacchinna-sādhya-vyāpaka-vyabhicāra eva upanyasanīyo nopādhih*. (329–30)

Tran. Objection: What should be introduced first is deviation from the probandum; if that is not established, an adjunct (is introduced).

Reply: But then an adjunct would not be a flaw in the actual reasoning. Moreover, it is deviation from what pervades the probandum as specified by the nature (or a feature) of the inferential subject that indeed then should be presented as the ground of deviation from the probandum, and not an adjunct.

MN identifies this view as that of Prabhakaropadhyaya (MN 329). What is implied is that deviation from the original probandum may be shown from deviation from the qualified probandum as long as the mark is nondeviant from the feature of the inferential subject [*Viśeṣaṇa-avyabhicāritve sati viśiṣṭa-sādhya-vyabhicāreṇa saādhanīyah*, MN 329; RS in GD 935]. That is, that the mark deviates from the original probandum may be inferred on the ground that the mark deviates from the qualified probandum if the mark is pervaded by the feature of the inferential subject. If this appears to suffer from the flaw of the mark not belonging to the inferential subject (*asiddhi*)—that is, if the mark is alleged not to deviate from the qualified probandum, the adjunct may be introduced to counter that [*Viśiṣṭa-vyabhicāre asiddhau udbhāvitāyām tat-siddhaye upādhih udbhāvyah*, RS in GD 935]. It is clear from the interpretation given by MN, RS, JD, GD and so on that the word "first" in the text is not meant to be taken as what is first as the premise but as what is first as the goal. The deviation from the original probandum is first in the sense that it is the main goal. But this is achieved through deviation from the qualified probandum that then comes first as a premise.

This view is similar to Gangesa's own view that we find later. It is rejected on the ground that an adjunct then would not be a flaw in the original inference (as it should be in Gangesa's view). Further, then the adjunct would not be the ground of the mark deviating from the probandum (as it should be in Gangesa's view presented later in the beginning of the section on the accepted view).

Text. *Syāt etat paryavasita-sādhya-vyāpakatve sati sādhana-avyāpakah upādhih, paryavasitam sādhyam pakṣa-dharmatā-bala-labhyam yathā śabdah anityatva-atirikta-śabda-dharma-atirikta-dharmavān meyatvāt iti atra paryavasitam yat sādhyam anityatvam tasya vyāpakam kṛtakatvam upādhih. Yadi ca tathā eva kṛtakatvam api śabde sādhyate tadā anityatvam upādhih. Tat-uktam vādi-ukta-sādhya-niyama-cyūtah api kathakai upādhih udbhāvya paryavasitam niyaman dūṣakatā-vīja-sāmrājyāt iti. Anena pakṣa-dharma-sādhana-avacchinna-sādhya-vyāpaka-upādhih samgṛhyate tādṛśa-sādhyasya paryavasitatvāt iti*. (331–33)

Tran. Objection: An adjunct is that which does not pervade the mark and pervades the probandum as refined (*paryavasita*). The probandum as refined is gathered from the import (*bala*) of the nature (or a feature) of the inferential

> subject or from the import of the mark's presence in the inferential subject. For example, "sound is possessed of a feature that is different from a feature of sound that is different from non-eternality because of being cognizable"—in this case the probandum as refined is non-eternality; being originated which pervades that is an adjunct. If in a similar way being originated is sought to be inferred in sound, then non-eternality is an adjunct. Thus it is said: "Debators may introduce, because of the imperial authority of the root of the fault, an adjunct even if it fails to pervade the probandum as stated by the proponent provided it (that adjunct) pervades (the probandum) as refined." This includes an adjunct that pervades the probandum as specified by the mark as well as an adjunct that pervades the probandum as specified by a feature (or the nature) of the inferential subject, for probanda like those too are "refined."

This is the view of the author of Ratnakośa. This combines the two views discussed earlier under one common description that applies to both probanda as specified by the mark and probanda as specified by a feature (or the nature) of the inferential subject. Now an adjunct is defined as that which pervades the probandum as refined. Both a probandum as specified by the mark and a probandum as specified by a feature (or the nature) of the inferential subject may be regarded as "refined."

In the example the probandum is stated in a complex way with the help of two negations that revert back to the original assertion, viz., that sound is non-eternal. Being a feature (of sound) that is different from a feature of sound that is different from non-eternality may be interpreted as nothing other than non-eternality. If so, being originated is an adjunct, for while all non-eternal things are originated, all cognizable things are not originated. Being a feature (of sound) that is different from a feature of sound that is different from non-eternality may of course be interpreted to stand for some other feature of sound, such as being related to time (*kāla-sambandhitva*). Then the situation is different. The more complex description leaves open more possibilities one or more of which may be utilized if needed: hence the more complex description.

In the Nyāya view sound is non-eternal; so the conclusion is true in the Nyāya view. Still, the reasoning is faulty for the Nyāya. That is, being cognizable is a wrong reason for claiming that sound is non-eternal. Thus the Nyāya recognizes that a given reasoning with a true conclusion may be unsound if a premise is false. Alternatively, the argument may be understood in the context of the Mīmāmsā view according to which sound is eternal and hence the conclusion is false (*Mīmāmsaka-matena tadabhidhānāt*, GD 937). Yet another alternative (by taking advantage of the complex description) is to interpret the probandum to stand for a feature of sound that is admittedly eternal from both the Nyāya and the Mīmāmsā standpoints, viz., the universal soundness (*śabdatva*) [*Śabda-śabdayoh bhāva-pradhānatvāt va*, GD 937].

Text. *Tat na. Evam hi dvyanukasya sāvayavatve siddhe dvyaṇukam anitya-dravya-asamavetam janya-mahatva-anadhikaraṇa-dravyatvāt iti atra niśśparśa-dravya-samavetatvam upādhih syāt. Bhavati hi nitya-dravya-samavetatvam paryavasitam sādhyam, tasya vyāpakam sādhana-avyāpakam ca. Kim ca pakṣa-dharmatā-bala-labhya-sādhya-siddhau niṣphala upādhih tadasiddhau ca kasya vyāpakah, na hi sopādhau pakṣa-dharmatā-balāt sādhyam sidhyati yasya vyāpakah upādhih syāt iti.* (333–35)

Tran. Reply: Not that. If this were so, (think of the following case). Suppose that it is proven that a dyad is made of parts. Then take the inference that a dyad is not inherent in any non-eternal substance, because it is a substance that is not possessed of originated measurable magnitude. Here "being inherent in a touchless substance" turns out (or threatens) to be an adjunct (although the inference, in the Nyāya view, is sound); indeed, being inherent in eternal substances is the "refined" probandum: the former pervades that but does not pervade the mark (viz., being a substance that is not possessed of originated measurable magnitude). Moreover, if the probandum is proved on the strength of the mark's presence in the inferential subject, an adjunct is ineffective; but if that is not proved, an adjunct should pervade what? If there is an adjunct, it is not the case that a probandum is proved on the strength of the mark's presence in the inferential subject so that an adjunct could pervade that.

The above view is rejected. First, he objects that the definition is too wide. He cites an inference that is accepted as sound. A dyad is the very first thing produced out of atoms by the conjunction of two atoms. Since a dyad inheres in atoms, it is not inherent in non-eternal substances. Moreover, a dyad is made of parts: it must inhere in some substances that can in this situation only be eternal substances. Further, a dyad is not perceptible and so the mark does belong to the inferential subject. The general premise that all composite substances that are not possessed of originated perceptible magnitude are inherent in eternal substances is also true (in Nyāya ontology).

The second objection is that if the probandum is proved from the mark's presence in the inferential subject, an adjunct cannot dislodge it. But if an adjunct is actually there, the probandum cannot be proved through such process. If the probandum thus lacks standing, how can an adjunct pervade that?

7

The Accepted View of Adjuncts: *Upādhivādasiddhāntah*

Text. *Atra ucyate. Yadvyabhicāritvena sādhanasya sādhyavyabhicāritvam sa upādhih*. (336)

Tran. Here (the following) is stated (or accepted). An adjunct is that due to deviation from which a mark deviates from the probandum.

One main use of an adjunct is to show that the mark is deviant in a case where the mark is found to be co-located and also co-absent with the probandum in a large number of instances. In such a case that the mark is deviant may be hard to detect. But finding an adjunct removes any doubt about deviation. To highlight this crucial role of an adjunct Gangesa states that at the very outset. This is not a formal definition: the latter follows. But the account may be interpreted to fulfill the requisite norms of a definition. In the latter case that an adjunct pervades the probandum should be taken as understood. Otherwise, that the mark is deviant does not follow necessarily. That is, unless an adjunct pervades the probandum, that a mark deviates from an adjunct does not show necessarily that the mark deviates from the probandum as well.

Text. *Lakṣaṇam tu paryavasita-sādhya-vyāpakatve sati sādhana-avyāpakatvam. Yat-dharma-avacchedena sādhyam prasiddham tat-avacchinnam paryavasitam sādhyam, sa ca dharmah kvacit sādhanam eva, kvacit dravyatvādi kvacit mahānasatvādi*. (336–41)

Tran. The definition is: (an adjunct) is that which pervades the probandum as refined and does not pervade the mark. A probandum is refined if it is specified in the way in which it is well known (or accepted). Such a feature is sometimes the mark, sometimes being a substance and so on and sometimes being a kitchen and so on.

Gangesa makes it clear that the definition covers both a probandum specified by the mark and a probandum specified by a feature (or the nature) of the inferential subject. In interpreting the probandum one should interpret it in the way in which it is well known or accepted (in a philosophical circle). This allows for the needed flexibility and control that should be observed in an interpretation. An example of the first case of a probandum specified by the mark is: a certain person is dark because of being a child of Mitra. The second example refers to a case of a probandum specified by a feature of the inferential subject: air is externally perceptible because of being knowable. Similarly, the third example refers to: this is smoky because of being fiery. These have been explained in the previous chapter.

Vyasatirtha has objected that this definition is too narrow because it fails to apply to the following case. Take the faulty inference that the pot is earthen because it is a substance. Now take the property of possessing a quale that does not belong to the pot. All things that are earthen and are other than the pot are also possessed of a quale that does not belong to the pot. At the same time, there are substances in which there is absence of being possessed of a quale that does not belong to the pot. Thus the property of possessing a quale that does not belong to the pot appears to pervade being earthen and not being the pot (the probandum specified in a certain way) and also not to pervade being a substance (the mark) and seems to fit the above definition of an adjunct. But if being a substance is also limited to those that possess a quale that does not belong to the pot (i.e., if we only take those substances that have a quale that does not belong to the pot just as we have taken only those earthen things that have a quale that does not belong to the pot), all such substances turn out to have a quale that does not belong the pot and so the said property would pervade the mark as thus specified and hence fail to fit the above definition (TT 100–101).

But this objection lacks teeth. Since the given inference is a straightforward case of deviation, no harm is done if this particular property fails to fit the definition of an adjunct. Second, Gangesa has mentioned (later in this very chapter as we shall see) that in some cases even a property that pervades the mark may be accepted as an adjunct. Then the said property could be called an adjunct from that perspective.

Vyasatirtha objects further that in the stock example of inferring smoke from fire wet fuel pervades smoke as specified by smokeness (i.e., all smoke is produced from wet fuel) and does not pervade fire as specified by fireness (i.e., not all fire is produced from wet fuel) and thus no further characterization of the probandum as being refined (*paryavasita*) is needed in this case (TT 102). But Gangesa has clarified that refinement includes cases of usage that are well known or accepted. In the given case specifying smoke by smokeness and

specifying fire by fireness represents usage that is well known and hence the definition does apply. On the other hand, without such refinement some accepted adjuncts fail to be covered by the definition as Gangesa has shown.

> Text. *Tathāhi sama-vyāptasya viṣama-vyāptasya vā sādhya-vyāpakasya vyabhicāreṇa sādhanasya sādhya-vyabhicārah sphutah eva, vyāpakavyabhicāriṇah tat-vyāpyavyabhicāra-niyamāt*. (345)

> Tran. Thus it is obvious that a mark deviates from the probandum if it deviates from that which pervades the probandum irrespective of whether (that pervader) is coextensive (with the probandum) or not, for that which deviates from the pervader as a rule deviates from what is pervaded by that.

Gangesa implies the following formally valid argument where A stands for the adjunct, H for the mark and P for the probandum.

All P is A.
Some H is not A.
Therefore, some H is not P.

He also adds by implication that the formal validity of the above argument is not affected by adding the premise that "All A is P." He implies that the premise is superfluous although it does not hurt to have it as an additional premise.

> Text. *Sādhana-avacchinna-pakṣa-dharma-avacchinna-sādhya-vyāpakayoh vyabhicāritvena sādhanasya sādhya-vyabhicāritvam eva, yathā dhvamsasya anityatve sādhye bhāvatvasya, vāyoh pratyakṣatve sādhye udbhūta-rūpavattvasya ca, viśeṣaṇa-avyabhicāriṇi sādhane viśiṣṭa-vyabhicārasya viśeṣya-vyabhicāra-niyamāt*. (345–47)

> Tran. If a mark deviates from the probandum qualified by the mark or qualified by a feature of the inferential subject, the former for sure deviates from the probandum, for if a mark does not deviate from the qualifier and deviates from the qualified, it as a rule deviates from the qualificand.

Deviation from something does not follow from deviation from that thing when it is qualified in some way, for the extension of that thing when it is qualified is smaller than that thing without the qualification. Still such deviation does follow if a condition is fulfilled, viz., if the deviator does not deviate from the qualifier and still deviates from the qualified. The qualified has two components—the qualificand and the qualifier. Since it is given that there is deviation from the qualified but not from the qualifier, it follows necessarily that there is deviation from the qualificand, for it is the only remaining component. In other words, since X deviates from Y or Z and since X does not

deviate from Y, it follows necessarily that X deviates from Z. As RS says, from the negation of one alternative there is inference of the other alternative (literally: there is inference with the other alternative as the qualifier) [*Eka-viśeṣa-bādhe bhāvayati viśeṣāntara-prakārikām anumitim*, RS in GD 990].

Text. *Ata eva na arthāntaram viśeṣaṇa-avyabhicāritvena jñāte sādhane viśiṣṭa-vyabhicārah sidhyan viśeṣya-sādhya-vyabhicāram ādāya eva sidhyati paksa-dharmatā-balāt, anyathā pratīteh aparyavasānāt. Na ca pakṣa-dharmatā-balāt prakṛta-siddhau arthāntaram*. (347–48)

Tran. Therefore, there is no fault of changing the subject; when it is known that the mark does not deviate from the qualifier and it is known that (the mark) deviates from the qualified, then this is known, on the strength of the nature of the inferential subject, surely by including deviation from the probandum that is the qualificand; otherwise the cognition is not properly analyzed. There is no fault of changing the subject when the actual subject is proven on the strength of the nature of the inferential subject.

The fault of changing the subject is alleged due to that the mark should be deviant from the probandum and not from the probandum as qualified. However, the fault is unfounded if the qualification of the probandum is gathered from the nature of the inferential subject, for the inferential subject is included in the thing to be proved. That the mark deviates from the probandum follows from that the mark deviates from the qualified probandum if it is given that the mark does not deviate from the qualifier; this is gathered from an analysis of the cognition, Gangesa remarks. That is, to say that the mark deviates from the qualified probandum and does not deviate from the qualifier necessarily implies through an analysis of the saying itself that the mark deviates from the qualificand or the probandum. Otherwise, as MN says, falsity is implied (*"aparyavasānāt" aparyavasāna-prasañgāt apramātva-prasañgāt*, MN 347). In other words, it is impossible for it to be true that the mark deviates from the qualified probandum and does not deviate from the qualifier and it to be false that it deviates from the probandum, the qualificand. If the latter is false, it must also be false that the mark deviates from the qualified probandum and does not deviate from the qualifier. The above terminology of cognition is different from that of modern analytic philosophers while explaining the concept of analyticity. Still, what Gangesa and MN say is close to the modern view that a truth is analytic if its denial is inconsistent.

RS points out that the view that deviation from the probandum follows from deviation from the qualified probandum while there is nondeviation from the qualifier is in accordance with the perspective that absence of the qualified is not different from absence of the qualifier and absence of the

qualificand [*Na ca atiricyate viśiṣṭa-abhāvo visesana-visesya-abhavabhyam iti matena idam*, RS in GD 990]. This view about absence of the qualified is debatable and some hold that such absence is different from absence of the qualifier and absence of the qualificand as Gangesa himself says later. If the latter view is accepted, deviation from the probandum does not follow from deviation from the qualified probandum and nondeviation from the qualifier unless certain other views are accepted as well, RS implies. The following passage throws further light on this.

Text. *Yat vā pratyaksa-sparśa-āśrayatvam pratyakṣatva-vyabhicāri dravyatva-avyabhicāritve sati dravya-pratyakṣatva-vyāpaka-vyabhicāritvāt mahatvavat, tathā mitrā-tanayatvam śyāmatva-vyābhicāri mitrā-tanayatva-avyabhicāritve sati śyāma-mitrā-tanayatva-vyāpaka-vyabhicāritvāt aghatvavat, avyabhicārah ca tat-samānādhikaraṇa-atyanta-abhāva-apratiyogitvam tat ca abhede api.* (348–51)

Tran. Alternatively: being the locus of perceptible touch deviates from perceptibility because of being nondeviant from substancehood and being deviant from what pervades perceptibility of a substance like nonatomic magnitude; similarly, being a child of Mitra deviates from being dark because of being nondeviant from being a child of Mitra and being deviant from what pervades being a dark child of Mitra like not being a pot. And nondeviation is not being the negatum of (any) absolute absence that is co-located with that; this applies to nondifference too.

The first specimen refers to the inference that air is perceptible because of being the locus of perceptible touch. Here being possessed of manifest color is the adjunct. While perceptibility is the probandum, being a perceptible substance is the qualified probandum. The qualified probandum is gathered from the nature of the inferential subject that in the given example is air and which is a substance. The argument shows that the mark, viz., being the locus of perceptible touch, deviates from the probandum perceptibility. This conclusion follows first on the ground that being the locus of perceptible touch does not deviate from substancehood—that is, all things possessed of perceptible touch are substances. The additional ground for the conclusion is that being the locus of perceptible touch deviates from what pervades being a perceptible substance. All (undisputed) perceptible substances are possessed of manifest color. Thus manifest color pervades the qualified probandum of being a perceptible substance. Being the locus of perceptible touch deviates from manifest color, for air lacks manifest color and has perceptible touch. However, since air is the inferential subject, nonatomic magnitude is cited as a confirming example. Nonatomic magnitude does not deviate from substancehood, for all things with nonatomic magnitude are substances. But nonatomic magnitude

deviates from manifest color, for some nonatomic substances (like the self) do not have manifest (or unmanifest) color. Thus it is established that the mark deviates from the qualified probandum and does not deviate from the qualifer. However, it is not concluded on that ground that the mark deviates from the probandum, for one may hold that absence of the qualified is different from absence of the qualifier and absence of the qualificand. Hence the conclusion is reached through the said inference.

In the previous view the said conclusion may be construed to have been reached through (in part) a formal law, viz., what deviates from the qualified and does not deviate from the qualifier deviates from the qualificand. The validity of this formal law presupposes that absence of the qualified is not different from absence of the qualifier and absence of the qualificand. Gangesa shows here how the said conclusion may be reached if that presupposition is rejected. Here instead of the formal law empirical generalizations provide the requisite premises. The empirical premises are obtained by substituting formal terms like qualificand and qualifier with concrete terms like being the locus of perceptible touch and being perceptible. Such explorations are common in Nyāya logic. However, these do not show that formal laws are neglected. The formal laws are duly recognized by the Nyāya as and when they are useful. But the said law may be challenged and so alternative solutions are offered as well in the interest of a rigorous, thorough, broad-based and comprehensive approach to the problem at hand. The other inference showing that being a child of Mitra deviates from being of dark complexion may be explained in a similar way. Significantly RS reports that the present view is Gangesa's own [*Sva-matena āha yat vā iti*, RS in GD 992]. Needless to say, different classical commentators and subcommentators have different interpretations of Gangesa's views. Still, the remark of RS who is arguably the most famous commentator on the inference part of Gangesa's work and who is a great philosopher in his own right deserves attention.

Text. *Yat vā yat sādhana-vyabhicāri sādhya-vyabhicāra-unnāyakah sa upādhih. Tattvam ca sākṣāt-paramparayā vā iti na arthāntaram*. (351–52)

Tran. Alternatively, that which deviates from the mark and provides the ground for deviation from the probandum is an adjunct. And that is directly or indirectly and thus there is no fault of changing the subject.

The ground for deviation is direct if the probandum itself is involved and is indirect if the probandum is qualified. The latter is indirect, for the inference of deviation from the qualified probandum becomes a ground for inferring deviation from the probandum itself. Previously, an adjunct was explained as

that because of deviation from which a mark becomes deviant from the probandum. This does not explicitly say that a feature that pervades a qualified probandum is also an adjunct. So an adjunct was next defined as that which pervades the refined probandum and does not pervade the mark. Now the import of both these earlier accounts is gathered in the present account. Since both that which provides the ground for deviation directly or indirectly are adjuncts both kinds of adjuncts that pervade the probandum itself or pervade the qualified probandum are covered. The charge of changing the subject is also then ruled out, for the indirect way of showing deviation from the probandum is now explicitly included in what is intended.

Text. *Kim ca arthāntarasya puruṣa-doṣatvāt ābhāsāntarasya tatra abhāvāt upādhih eva bhāvatvādikam doṣah*. (352–53)

Tran. Moreover, since changing the subject is a fault that affects the person (engaged in a debate) and since no other fault is involved there, adjuncts like positivity and so on are themselves the faults.

Changing the subject is listed as a ground of defeat and not as a pseudo-probans. A pseudo-probans is considered to be a more serious defect than an average ground of defeat. Other kinds of pseudo-probans are not relevant here. By including something that pervades the qualified probandum as an adjunct the said cases are classifiable under pseudo-probantia. This gives due weight to the nature of the fault detected in such cases. The example of positivity (*bhāvatva*) refers to the inference that posterior absence comes to an end because of being originated; here positivity is an adjunct.

Text. *Na ca evam śabdah abhidheyah prameyatvāt iti atra aśrāvanatvam jalam prameyam rasavattvāt iti atra pṛthivītvam upādhih syāt, kevala-anvayitva-sādhaka-pramāṇena tatra sādhya-siddheh upādheh viśiṣṭa-avyāpakatvāt*. (353–54)

Tran. Objection: In this way inaudibility turns out to be an adjunct in (the sound inference) that sound is nameable because of being knowable and being of the nature of earth turns out to be an adjunct in (the sound inference) that water is knowable because of being a liquid. Reply: No. When the probanda there are shown to be omnilocated, (the putative) adjuncts are found not to pervade the qualified (probanda).

The objection arises from the acceptance of adjuncts that pervade qualified probanda. In the first inference sound is the inferential subject. One of its features is being a quale. The qualified probandum thus can be taken to be all nameables that are qualia (except sound, the inferential subject). Inaudibility

pervades them but does not pervade knowability, the mark. Gangesa replies that nameability can be shown to be omnilocated. Then that the putative adjunct pervades the probandum itself cannot be true, for some nameable things are not inaudible. As already explained, an adjunct that pervades the qualified probandum is a fault by way of providing the ground for deviation from the probandum itself (*śuddha-sādhya)*. Since the latter condition is not fulfilled, this is not an adjunct. Similar remarks apply to the other case.

> Text. *Na ca pakṣetare sva-vyāghātakatvena anupādhau ativyāptih tatra anukūla-tarka-abhāvena sādhya-vyāpakatva-aniścayāt sahacāra-darśanādeh tena vinā samśāyakatvāt iti uktam*. (354–55)

> Tran. It is not also the case that there is overcoverage of "being other than the subject" that is not an adjunct because of being self-stultifying, for in that case, since there is no supportive CR, pervasion of the probandum is uncertain; indeed, it has been said that without that (= supportive CR) observation of co-presence and so on are subject to doubt.

One could object that the suggested definitions of an adjunct, like the earlier definitions in the previous chapter, overextend to bois. Suppose that an adjunct is defined as that due to deviation from which a mark deviates from the probandum. This appears to be true of bois: bois appears to pervade the probandum for reasons explained in the previous chapter; the mark is also present in the inferential subject where bois is necessarily absent and so the mark deviates from bois and, therefore, also from the probandum. Thus, since the mark's deviation from the probandum is due to its deviation from bois, requirements of the said definition are fulfilled. The two other definitions of an adjunct can also be shown to apply to bois similarly. But if the latter were accepted as an adjunct, it would undermine all such probans-based inferences including the inference of deviation from the probandum without which it could not be an adjunct [*Pakṣetarasya upādhitve sarvatra eva tādṛśa-upādhi-sambhavena anumāna-mātra-ucchede vyabhicāra-anumāna-adhīnasya upādheh dūṣakatvasya asambhavāt*, MN 356; *pakṣetarasya upādhitve sarvatra eva tādṛśa-upādhi-sambhavena anumāna-mātra-vilope vyabhicāra-anumāpakatva-garbhasya upādhitvasya avyāghāta iti parāstam*, GD 1008]. So it is not an adjunct and, therefore, the definitions are not too wide.

Gangesa replies that the definitions would not apply unless bois were known to pervade the probandum. Some of the grounds for the latter knowledge are available, such as observation of co-presence. But in spite of them pervasion is doubtful unless it is additionally supported by CR. Bois is not supported by CR and pervasion of the probandum is uncertain; so the definitions are not too wide.

Text. *Bādha-unnīte ca anukūla-tarkah asti eva iti*. (355)

Tran. And in the case (where bois is an adjunct) and the mark is countermanded a supportive CR is for sure available.

The situation is different if the mark is countermanded, for then the probandum is known to be absent in the inferential subject where the said adjunct is also absent. If then the mark is present in the inferential subject, it is known to be deviant from the probandum and thus the doubt over such deviation is obstructed [*Upādhi-abhāvavati pakṣe sādhya-abhāva-niścasya eva vyabhicāra-samśaya-pratibandhakatvena anukūla-tarkatvāt*, MN 346].

Text. *Evam parvata-avayava-vṛtti-anyatvādeh api na upadhitvam pakṣa-mātra-vyāvartaka-viśeṣaṇavattvāt*. (355–56)

Tran. Thus "being different from what resides in the hill parts" and so on too are not adjuncts, for they include a qualifier that leaves out only the inferential subject.

If the hill is the inferential subject, "being other than the inferential subject" may also be expressed as "being different from what resides in the hill parts," for the hill as a substance resides in its parts. Then, for reasons explained in the previous chapter, the phrase "what resides in the hill parts" is useful only to prevent the mark from failing to belong to the inferential subject and not useful for preventing deviation. This disqualifies it from being an adjunct, for then it cannot fulfill the required role in the inference of deviation.

Needless to say, the said phrase may leave out not only the inferential subject in a given case but also such things residing in parts of the hill as color and so on. So the implication may be explained as follows: just as bois fails to pervade the probandum because of the lack of supportive CR, so also "being different from what resides in the hill parts" and so on fail to pervade the probandum because of the lack of supportive CR [*Yadi api parvata-avayava-rūpadeh api vyāvarttanat na pakṣa-mātra-vyāvartaka-viśeṣaṇavattvam . . . tathā api . . . yathā anukūla-tarka-abhāvena na tādṛśa-sādhya-vyāpakatā-niścayah tathā atra api iti*, MN 356].

Text. *Ata eva dhūme ārdrendhana-prabhava-vahnimattvam, dravya-vahirindriya-pratyaksatve udbhūta-rūpavattvam, mitrā-tanaya-śyāmatve śāka-pākajatvam, janya-anityatve bhāvatvam upādhih, tadutkarṣeṇa sādhya-utkarṣāt, ananyathāsiddha-anvaya-vyatirekatah vaidyakāt karaṇatā-avagamena ghata-unmajjana-prasañgena sādhya-vyāpakatā-niścayāt*. (356–57)

Tran. Therefore, "being a fire produced out of wet fuel" in (inferring) smoke, manifest color in (inferring) a substance that is perceived by an external sense

> organ, "being due to the consumption of certain vegetables" in (inferring) being a dark child of Mitra and positivity in (inferring) non-eternality that has a beginning are adjuncts, for the probandum increases from the increase of that, (also) for the causal connection is known from experts of medicine and from indispensably necessary co-presence and co-absence (and moreover) for involving the consequence that the pot is reproduced and thus it is known that (the adjunct) pervades the probandum.

"Therefore" means that supportive CR is available [*Ataeva iti vyāpakatā-grāhaka-anukūla-tarka-sattvāt eva iti arthah*, MN 356]. The first example is with reference to inferring smoke from fire where being a fire produced out of wet fuel is the adjunct. The supportive reason here is based on concomitant variation. The greater the quantity of wet fuel the greater is the amount of smoke produced. This lends support to the induction that wherever there is smoke there is fire produced out of wet fuel and thus that the adjunct pervades the probandum. The second example refers to inferring that air is a substance that is perceived by an external sense organ because air has manifest touch in which manifest color is the adjunct. The supportive reason is: possession of manifest color is an indispensably necessary condition for being an externally perceptible substance, for in all undisputed and carefully studied cases externally perceptible substances are found through varied observation of co-presence and co-absence to have manifest color. The third example refers to inferring that a certain lame person is dark because he is a son of Mitra where consumption of certain vegetables is the adjunct. That consumption of certain vegetables is a causal condition of dark complexion is supported by the opinion of medical experts. [It may be noted that appealing to an authority is not a fallacy if the opinion falls within the expertise of the authority. This is why Gangesa mentions a medical expert who, as may be gathered from Sanskrit works on medicine, studied the connection between dietary habit and bodily complexion.] The last example is with reference to inferring that posterior absence has an end because of having a beginning where positivity is the adjunct. That something with a beginning must have an end is an induction that is false because only positive things with a beginning have an end. A negative entity need not be so; it may have no beginning and may have an end (like prior absence); it may have a beginning and no end (like posterior absence); it may have no beginning and no end (like absolute absence of color in air) or (according to some) it may have a beginning and an end (like temporary absence of a book on a table). That posterior absence has a beginning and no end is supported by the reasoning that for it to come to an end the thing destroyed must come back. (This is the point of "involving the consequence that the pot is reproduced" in the text.) But, for example, a pot that is destroyed cannot be reproduced, for the original conjunction of parts that came to an end when

the parts were separated cannot be brought back. When the parts are reassembled what we have is a new conjunction that begins to exist at that time and, therefore, although the new pot may look exactly like the previous pot, the former must be different from the latter. Since reemergence of a destroyed thing is ruled out, posterior absence is endless though it has a beginning.

Text. *Tat kim kārya-kāraṇayoh eva vyāptih tathā ca bahu vyākulī syāt iti cet. Na. Tat-upajīvya-anyeṣām api anukūla-tarkena vyāpti-grahāt*. (357–58)

Tran. Objection: Is there pervasion only between an effect and a causal condition? But then there would be many problems. Reply: No. Pervasion is known with the help of supportive CR in other cases that are linked to that (= causal connection).

In the Buddhist view pervasion must always be based on causal connection except when the pervaded and the pervader are related by way of identity (*tādātmya*). The objector is not a Buddhist, for the objector does not speak of identity as a separate ground for pervasion. Still, the objector asks if causation is the only proper ground for pervasion. The standard Nyāya position is that the pervaded and the pervader are not always directly related as an effect and a causal condition. Nevertheless, an indirect causal connection should be found as a support for the pervasion. For example, being water is a probans for inferring being a substance, for water is a kind of substance. But water is not an effect of being a substance. Still, one may argue as follows: if there were some water that is not a substance, it would not be conjoined with anything, for only substances are capable of being conjoined. In the light of Nyāya ontology conjunction is a quale that inheres in only substances that are the causal substrates (*samavāyi-kāraṇa*) of conjunction. In other words, being a substance is the specifier of the fact of being a causal substratum (*samavāyi-kāraṇatā-avacchedaka*) of conjunction. We do not have the space to delve into Nyāya ontology here; but further exploration would show that such claims are backed by a rigorous and comprehensive metaphysics. In this way an indirect causal connection is found for the pervasion that all water is a substance [*Dravyatva-jalatva-ādi-sthale api jalatvam yadi dravyatva-vyabhicāi syāt tadā samyoga-vyabhicāri syāt samyogatva-avacchinnam prati dravyatvena samavayi-kāraṇatvāt iti paramparayā samyogatva-avacchinna-dravyatva-avacchinna-kāryakāraṇabhāva-graha-upajīvi tarka eva vyāpti-grāhaka*, MN 358]. Similar indirect causal foundation should be worked out in cases of pervasion where direct causal connection is missing.

Text. *Yatra ca sādhya-upādhyoh hetu-sādhyoh vā vyapti-grāhaka-sāmyāt na ekatra vyāpti-niścayah tatra sandigdha-upādhitvam vyabhicāra-samśaya-upādhayakatvat*. (358)

Tran. In a case where the grounds for that the adjunct pervades the probandum or for that the probandum pervades the mark are equivalent, there the presence of an adjunct is suspected, for doubt is called for.

Gangesa explains the nature of a suspected adjunct. In this case there are equivalent grounds for saying that the probandum is pervaded by the adjunct and also that the mark is pervaded by the probandum. The said grounds are observation of co-presence, observation of co-absence and nonobservation of a counterexample. In such a case it is less than certain that an adjunct is present. But the suspicion of presence of an adjunct is reasonable here and the grounds of doubt are fulfilled. The latter grounds are ascription of opposed features to the same thing. Here there are equivalent grounds for saying both that the probandum belongs and does not belong to the inferential subject.

Text. *Yadā ca tādṛśe ekatra-anukūla-tarka-avatārah tadā hetutvam upādhitvam vā niścitam*. (358)

Tran. In such a case when there is supportive CR available on one side, it is ascertained that there is a probans or that there is an adjunct.

This refers to the situation when the observational evidence for two conflicting claims has the same weight, viz., that the probandum is pervaded by the adjunct and that the mark is pervaded by the probandum. In such a case supportive CR may be available for one side that shows that (1) the probandum is pervaded by the adjunct or (2) that the mark is pervaded by the probandum but not both. If the former, it is reasonable to believe that an adjunct is present. If the latter, it is reasonable to believe that a probans is available.

Text. *Pakṣetarasya sva-vyāghātakatvena na hetu-vyabhicāra-samśāyakatvam atah na sandigdha-upādhih api sah*. (358)

Tran. Since "being other than the inferential subject" is self-refuting, it cannot provide the ground for the doubt that the mark is deviant and, therefore, it falls short of being a suspected adjunct as well.

Can bois provide the basis for the weaker claim of presence of a suspected adjunct? No, says Gangesa. Since bois undermines even the inference that the mark is deviant, it cannot provide the ground for the suspicion that an adjunct is present, for that too needs an inferential base that is not there.

Text. *Yat tu paksetarasya yathā sādhya-vyāpakatvam tathā sādhya-abhāva-vyāpakatvm api grāhaka-sāmyāt, tathā ca ubhaya-vyāpaka-nivṛttyā sādhya-tadabhāvābhyām pakṣe nivarttitavyam na ca evam, tathā ca sādhya-vyāpakatā-samśayena sandigdhah katham param dūṣayet iti*. (359–60)

Tran. Objection: Just as "being other than the inferential subject" may be said to pervade the probandum so also it may be said to pervade absence of the probandum, for the epistemic grounds are equivalent; accordingly, from the negation of the pervader of both, both the negation of the probandum and negation of absence of that (= the probandum) in the inferential subject should follow; but this is not so; thus, since it (= bois) is (already) suspect because that it pervades the probandum is doubtful, how can it fault something else?

The objector raises the issue if bois is a proper ground of concern. The said feature may be said not only to pervade the probandum but also absence of the probandum. This is for the simple reason that just as all the *sapakṣas* are different from the inferential subject so also all the *vipakṣas* are different from the inferential subject. A *sapakṣa* or a positive example is an example where presence of the probandum is certain. On the other hand, a *vipakṣa* or a negative example is an example where absence of the probandum is certain. Since presence (or absence) of the probandum in the inferential subject is open to doubt, an inferential subject is neither a positive nor a negative example. Thus it follows from reflective analysis that bois should pervade both the probandum and absence of the probandum if the ground of pervasion is being co-located with wherever the presence of the pervaded is certain. In other words, bois is co-located with the probandum in all positive examples and is also co-located with absence of the probandum in all negative examples. Now bois is absent in the inferential subject, for the inferential subject cannot be other than itself. Since thus the pervader is absent, the pervaded too must be absent. Both the probandum and its absence are here the pervaded things. So it follows that both the probandum and its absence are absent in the inferential subject. But this amounts to saying that the probandum is both present and absent in the inferential subject. This cannot be true. Thus bois leads to a contradiction that is unacceptable. Something that leads to an unacceptable conclusion is itself unacceptable as implied in the rule of reduction that if an assumption leads to a contradiction, the assumption is false.

Further, it has already been explained why that the said feature pervades the probandum is subject to doubt. That already makes the standing of that feature as an adjunct suspect. Now that the said feature is further seen to lead to an impossible consequence, it should be dismissed as something irrelevant and incapable of showing that the mark is faulty.

Text. *Tat na. Tathā hi sādhya-vyāpakatā-pakṣam ālambya hetu-vyabhicāra-saṃśaya-ādhāyakatvena dūṣaṇam syāt eva*. (360)

Tran. Reply: Not that. In that way it (bois) would have been a fault by providing the ground for the doubt that the mark is deviant following from the alternative that it pervades the probandum.

Even something that leads to an impossible consequence may provide the ground for doubting some judgment, in this case the judgment that the mark is pervaded by the probandum. The objector appears to overlook the crucial role played by CR as a ground for pervasion. If that is overlooked, bois may be said to pervade the probandum and thus provide the ground for the doubt that the mark is deviant, for the mark is present in the inferential subject where the said feature and the probandum are, by implication, absent. In other words, if the role of CR is overlooked, the said feature would present a serious problem.

Text. *Nanu yatra upādhih tatra anukūla-tarkah yadi nāsti tadā tat-abhāvena eva vyāpteh agraha, atha asti tadā sādhya-vyāpya-avyāpakatvena upādheh* [*upādheh* is substituted for *upādhih* in print] *sādhya-avyāpakatva-niścayāt na upadhih iti ubhayathā api na upādhih dūṣaṇam*. (360–61)

Tran. Objection: If an adjunct is involved and no supportive CR is available, the pervasion is not known for the lack of that alone. On the other hand, if that is available, since the (putative) adjunct fails to pervade that which is pervaded by the probandum, the (putative) adjunct is ascertained not to pervade the probandum and thus not to be an adjunct. Either way, an adjunct turns out not to be a proper ground of refutation.

Here is another argument to show that an adjunct is not a fault. There are two possibilities if an adjunct appears to be found in a given case: either a supportive CR is available for the pervasion in that case or not. If the latter, the pervasion fails for that reason alone, for if a pervasion is not backed by a supportive CR, it is not reliable. Thus the adjunct is superfluous and unnecessary to show that the mark is unreliable. On the other hand, a supportive CR may be available in a case where an adjunct seems to be present. But then the pervasion is reliable and it is reasonable to say that the mark is pervaded by the probandum. However, it follows from the definition of an adjunct that it does not pervade the mark. Thus the adjunct turns out not to pervade that which is pervaded by the probandum. However, it is a fact of logic that if something does not pervade what is pervaded by something else, it does not pervade the latter. This logical law is not explicitly stated but is clearly implied in the text. The reasoning may be reformulated as below by letting M stand for the mark, P for the probandum and A for the adjunct.

Some M is not A.
All M is P.
Therefore, some P is not A.

This is a faithful reconstruction of the reasoning in the text: "that the adjunct does not pervade the probandum" is the conclusion and "that the ad-

junct does not pervade that which is pervaded by the probandum" is the premise. The general terms adjunct, mark and probandum play the role of variables and the reasoning as stated in the text is formally valid. [Nyāya logic is not merely formal logic, for the Nyāya deals with the full range of logical issues of which formal logic is only a small part. But the above reformulation helps to show once again that the Nyāya pays attention to formal laws when useful. If the Nyāya formal laws are put together in a systematic way, it would be clear that the Nyāya has made a substantial contribution to formal logic.]

It follows from the above that the putative adjunct does not pervade the probandum and, therefore, does not fulfill the definitional requirements of an adjunct. The two alternatives mentioned above exhaust all possibilities. No matter what, then, an adjunct should not be recognized as a fault.

Text. *Na ca vyāpti-abhāva-vyāpyam ubhayam atah upādhih api tat-abhāva-unnayanena doṣah iti vācyam. Upādheh ātma-lābha-artham anukūla-tarka-abhāva-upajīvakatvena tasya eva doṣatvāt iti cet.* (361–62)

Tran. Objection: It should not be said that since both are pervaded by lack of pervasion, an adjunct is a fault by way of being a ground for lack of that (pervasion). Since the very being of an adjunct presupposes the absence of supportive CR, what if that (absence of CR) alone is the fault?

This is an objection within an objection and a reply to show that the objection is sound. The objector holds that an adjunct should not be recognized as a separate fault, for it is explained away by other faults that are logically prior. The objection is challenged on the following ground. Presence of an adjunct shows lack of pervasion and so does lack of supportive CR. So an adjunct should be recognized as a fault by way of being a ground for lack pervasion. Since both an adjunct and lack of supportive CR are grounds for the same thing, it is unreasonable to accept one as a fault and not the other.

In reply and in defense of the objection it is argued that lack of supportive reasoning is more basic than presence of an adjunct. The latter presupposes the former but not vice versa. So the former should be recognized as the fault. This argument may be interpreted to imply an argument from economy (*lāghava*) by way of cognitive order (*upasthiti*). It is more economical by way of cognitive order, because the determination that there is an adjunct presupposes that there is lack of supportive reasoning.

Text. *Na. Sopādhau ekatra sādhya-tat-abhāva-sambandhasya viruddhatvāt avaccheda-bhedena tat-ubhaya-sambandho vācyah, tathā ca sādhane sādhya-sambandhitā-avacchedakam rūpam upādhih āvaśyakah tathā anukūla-tarka-abhāvah api āvaśyakah iti ubhayoh api vinigamaka-abhāvāt dūṣakatvāt.* (362–64)

Tran. Reply: No. If there is an adjunct, since that the probandum and its absence belong to the same thing are opposed, the relation of both of those should be stated with reference to different specifiers. Accordingly, an adjunct is necessary as the specifying feature for the relation of the mark with the probandum. In that way, absence of supportive CR is also necessary; thus both are faults, for there is no reason that tilts the balance on either side.

Gangesa rejects the objection that an adjunct need not be recognized as a fault. His argument is as below. In a typical case of an adjunct there is usually apparent evidence by way of observation of co-absence and co-presence that the mark is pervaded by the probandum and, further, that the mark belongs to the inferential subject. Then it follows that the probandum belongs to the inferential subject. But once an adjunct is detected, it follows that absence of the probandum belongs to the inferential subject. But both that the probandum and its absence belong to the inferential subject cannot be true, for they are opposed. Alternatively, both that the mark is pervaded by the probandum and not pervaded by the probandum are opposed and cannot both be true. The opposition, however, is avoided if different specifiers are introduced. That is, the mark may be said to be pervaded by the probandum in so far as the mark is associated with the adjunct and not otherwise. Thus the admission of an adjunct is necessary to avoid a seeming contradiction and, accordingly, it may also be recognized as a fault and a ground for deviation, for that follows from its role as the specifier of the relation of pervasion between the mark and the probandum. But the determination of an adjunct presupposes that there is no supportive CR; if there were supportive reasoning, the determination of an adjunct would not have been possible. Accordingly, lack of supportive CR is also necessary. Since both are necessary, both should be recognized as faults.

The objector's argument from the logical priority of absence of supportive CR over the determination of an adjunct is not persuasive. Here the need for lack of supportive CR is due to the role of an adjunct. The latter cannot be rendered superfluous by the former, for if the latter is superfluous, the former is superfluous too.

MN draws attention to that supporting CR is not a causal condition of awareness of pervasion. So there may be a case where there is awareness of pervasion but no supportive CR. Suppose further that in such a case there is no awareness of a counterexample in any other way but an adjunct has been detected. Then in such a case the adjunct serves as an obstruction to the awareness of pervasion and thus at least in some cases an adjunct should be recognized as a fault [*Anukūla-tarkasya vyāpti-graham prati ahetutvena yadā anukūla-tarka-sphurttih nāsti, prakārāntareṇa ca vyabhicāra-grahah api nāsti, athaca upādhitva-jñānam varttate, tadā api vyāpti-graha-pratibandhena tat-doṣatāyāh āvaśyakatvāt*, MN 363].

GD argues that absence of supportive CR does not by itself promote absence of awareness of pervasion; rather, the former does so through awareness of deviation. Awareness of deviation, however, depends on detection of an adjunct (in some cases). Accordingly, the standing of an adjunct as a fault is not barred [*Tathā ca anukūla-tarka-abhāvah na svatah vyāpti-agraha-prayojakah api tu vyabhicāra-graha-dvārā, sa ca sopādhitva-jñānam apekṣate iti tat-dvārā upādheh dūṣakatvam nirabādham iti*, GD 1031].

Text. *Anye tu yat-vyāvṛttyā yasya sādhanasya sādhyam nivarttate sa dharmah tatra hetau upādhih, sa ca dharmah yasya abhāvāt pakṣe sādhya-sādhana-sambandha-abhāvah yathā ārdrendhanavattvam, vyāvarttate hi tat-vyāvṛttyā dhūmavattvam ayogolake. Ataeva tatra sādhya-sādhana-sambandha-abhāvah pakṣe. Evam bhāvatva-vyāvṛttyā dhavmse janyatva-anityatvayoh sambandhah nivarttamānah pakṣa-dharmataā-balāt anityatva-abhāvam ādāya siddhyati, tathā vāyau udbhūta-rūpavattvam nivarttamānam vahirdravyatve sati pratyakṣatvam nivarttayat pratyakṣatva-abhāvam ādāya siddhyati, tathā ca ubhayatra api pakṣe sādhya-abhāva-siddhyā sādhya-sādhana-sambandha-abhāvah asti iti*. (365–68)

Tran. Others hold the following: that feature due to the negation of which there is removal of the probandum from a mark is an adjunct for that mark; and that feature is that due to the absence of which there is lack of the relation between the mark and the probandum in the inferential subject (e.g., having wet fuel). Indeed, from the negation of that possession of smoke is negated in an iron ball and, therefore, there is lack of the relation between the mark and the probandum in the inferential subject. In this way from the negation of positivity there is cancellation of the relation between being originated and being non-eternal in posterior absence and this by implication proves absence of non-eternality (in posterior absence) by dint of that the mark belongs to the inferential subject (or by dint of the nature or a feature of the inferential subject). In a similar way, since there is cancellation of being a substance that is externally perceptible from the cancellation of manifest color in air, nonperceptibility (of air) is proved by implication. Thus in both cases from the proof of absence of the probandum in the inferential subject there is lack of the relation between the mark and the probandum (in the inferential subject).

As both MN and RS point out, the word "mark" should be interpreted as the locus of the mark. Accordingly, what is meant by cancellation of the probandum with reference to a mark is that there is absence of the probandum in the locus of the mark. Thus an adjunct is that due to the absence of which in a locus of the mark there is also absence of the probandum in that locus of the mark [*Yat-dharma-avacchinna-pratiyogitāka-abhāva-adhikaraṇībhūtam sādhanatā-avacchedaka-avacchinna-adhikaraṇam saādhya-abhāva-*

adhikaraṇam tat-dharma-avacchinnatvam upādhitvam, MN 363]. This is why the probandum is cancelled or taken away from the mark. That is, the adjunct is absent in a locus of the mark and so is also the probandum absent in that locus. This makes the mark deviant and the probandum is taken away or gone in the sense that the mark is no longer a sound reason for inferring the probandum. In a previous definition of an adjunct, the latter was said to be something that does not pervade the mark and so on. That an adjunct does not pervade the mark is not explicitly stated in the present definition. This may indicate that here an adjunct is taken to be a fault by way of providing an equally good reason for absence of the probandum in the inferential subject [*Sat-pratipaksa-unnāyakatvam ca atra dūṣakatā-bījam*, RS in GD 1031].

It is also implied that in other places where the mark and the probandum are present together the adjunct is also present. This is also implied in the three earlier definitions. That is, it follows from the three earlier definitions as well as the present definition that although it is false that the mark is pervaded by the probandum it is nevertheless true that the mark as associated with the adjunct is pervaded by the probandum. Accordingly, although the mark alone is not a sound reason for inferring the probandum, the mark associated with the adjunct is a sound reason for inferring the probandum. This aspect of an adjunct is indicated in the immediately previous passage where an adjunct is said to be the specifier of the relation of pervasion between the mark and the probandum (*sadhane sādhya-sambandhitā-avacchedakam rūpam upādhih*). Now this is expressed in a different way by saying that an adjunct is that feature due to absence of which there is lack of the relation (of pervasion) between the mark and the probandum in the inferential subject. (*Sa ca dharmo yasya abhāvāt pakṣe sādhya-sādhana-sambandha-abhāvah*.) It is implied that if the adjunct were present rather than being absent in the inferential subject, there would have been the requisite relation (of pervasion and the relation of the implier and the implied: *gamya-gamaka-bhāva*) between the mark and the probandum rather than the lack of it. The study of adjuncts then is useful mainly for three different reasons. First, it shows that a seemingly sound mark that is observed to be co-present and co-absent with the probandum in numerous cases is deviant and, therefore, not a sound reason for inferring the probandum. Second, it shows that absence of the adjunct is a sound reason for inferring absence of the probandum. Third, it shows how the original mark can be modified and corrected and become a sound reason for inferring the original probandum. Thus an adjunct combines both the roles of a fault and a corrective measure.

The first example is the already familiar inference of smoke from fire in which wet fuel is the adjunct. A hot iron ball is something in which fire, the mark, is present. But wet fuel, the adjunct, is absent there and so is also smoke,

the probandum. Since the probandum is absent in a locus of the mark, it follows that there is absence of the relation of pervasion between the mark and the probandum, for presence of the mark in a locus of absence of the probandum necessarily implies the lack of the relation of pervasion between the mark and the probandum [*Śuddha-sādhya-abhāva-unnāyakasya ārdrendhnavattvādeh katham sādhya-sādhana-sambandha-abhāva-unnāyakatvam? . . . Sādhya-abhāva-sattve sādhya-sādhana-sambandha-abhāvasya āvaśyakatvāt tat-unnāyakatvam akṣatam*, RS in GD 1033]. The point is to show that there is absence of the probandum in the inferential subject or in some locus of the mark [*Pakṣe kvacit-sādhanavati vā sādhya-abhāvasya . . . unnayana-prakārah*, RS in GD 1032]. Jagadisa remarks that the word "sometimes" (*kvacit*) in the text of RS indicates that absence of the probandum is co-located with possession of the mark and that necessarily implies deviation [*Sādhanavattva-sāmānādhikaranyena sādhya-abhāva-unnayanasya sūcanāya kvacit-ukttih tavatā eva vyabhicāra-dhiyah sampatteh*, JD 592]. Gadadhara also remarks that it is unnecessary (*aprayojaka*) to show that the probandum is absent in all loci of the mark, for there is deviation even if the probandum is absent in any one place where the mark is present; this is why RS speaks of "some" locus of the mark [*Sādhanatva-avacchedena sādhya-abhāva-unnayanam aprayojakam, yat-kincit-sādhanavati sādhya-abhāvavattvasya eva vyabhicāratvāt atah kvacit sādhanavati iti uktam*, GD 1033]. But why should then RS speak of also absence of the probandum in the inferential subject? Gadadhara explains this as follows. If the intention is to prove that the probandum belongs to some of the inferential subjects, it is only showing that the probandum is absent in all inferential subjects that can achieve the task of an adjunct; this is why RS speaks of the inferential subject as a whole [*Pakṣatā-avacchedaka-sāmānādhikaraṇyena sādhya-siddheh uddyeśyatve pakṣatā-avacchedaka-avacchedena sādhya-abhāva-unnayanam eva upādhitā-nirvāhakam atah pakṣah iti sāmānyatah uktam*, GD 1033]. Gadadhara implies that if the intention is to prove that the probandum belongs to some of the inferential subjects, showing that the probandum is absent in some of the inferential subjects cannot achieve the task of an adjunct. This is formally correct. "Some S is P" is contradicted by "No S is P" and not by "Some S is not P." Similarly, "Some S is not P" is contradicted by "All S is P" and not by "Some S is P."

Text. *Ataeva bādha-anunnīta-pakṣetarasya anupādhitvam svavyāghātakatvena tat-vyatirekasya sādhya-avyāvakarttakatvāt iti.* (368–69)

Tran. Therefore, "being other than the inferential subject" in a case where the mark is not countermanded is not an adjunct, for it is self-stultifying and so its absence does not prove absence of the probandum.

MN says that bois is accepted as an adjunct in such an inference as that the iron ball is smoky because of being fiery [*Ayo-golakam dhūmavat vahneh iti atra pakṣetaratvasya upaādhitvam asti eva*, MN 369]. Here the mark is countermanded in the sense that it is already known that the iron ball is not smoky and that the conclusion to be inferred is false. Since all smoky things are different from the iron ball, bois pervades the probandum, but the said feature does not pervade fire, the mark, for there is fire in the iron ball where the said feature is absent. Thus the definition of an adjunct applies to the said feature in such a case.

Text. *Yat tu upādhi-mātrasya lakṣaṇam vyatireki-dharmatvam pakṣetarah api kvacit upādhih, tat-tat-upādheh tu tat-tat-sādhya-vyāpakatve sati tat-tat-sādhana-avyāpakatvam. Na ca dhūma-vahni-sambanhopādhih pakṣetaratvam syāt iti vācyam. Āpādya-aprasiddheh iti.* (369–71)

Tran. Objection: Being a feature that is not omnilocated is the defining feature of all adjuncts. "Being other than the inferential subject" is also an adjunct sometimes. Particular adjuncts are to be defined as being pervasive of particular probanda and not being pervasive of particular marks. It should not be said that bois turns out to be an adjunct in the relation between smoke and fire, for the consequent is not accepted.

This view is held by some thinkers other than Gangesa. An adjunct is now defined as a feature that is not omnilocated, because an adjunct does not (usually) pervade the mark and an omnilocated property cannot be nonpervasive of the mark. Thus, all adjuncts are features that are not omnilocated and all features that are not omnilocated are potential adjuncts in some inference. These thinkers also hold that particular adjuncts are definable as being pervasive of particular probanda and not being pervasive of particular marks. Finally, these thinkers explain why bois should still not be recognized as an adjunct. "The consequent is not accepted" refers to the following in inferring fire from smoke: it is not accepted that bois pervades fire and does not pervade smoke, for there is no supportive CR to show that the said feature pervades fire.

Text. *Tat na. Anumiti-pratibandhaka-jñāna-visayatā-avacchedakam upādhitvam iha nirūpyam tat ca na vyatirekitvam atiprasañgāt viśeṣa-lakṣaṇe vahni-dhūma-sambandhe pakṣetarasya upādhitva-prasañgāt ca.* (371–74)

Tran. Reply: Not that. What is under consideration here is an adjunct in so far as it is a specifier of the fact of being a content of an awareness that obstructs inference. Not being omnilocated is not that, for there is an unacceptable consequence. And if a particularized definition is considered, bois turns out to be an adjunct, an unacceptable consequence, for the relation between fire and smoke.

Gangesa rejects the above view. He argues that our interest in the topic of adjunct is mainly due to the fact that its awareness places an obstacle in inferring the probandum. The earlier definitions are consistent with that, for they draw attention to leading to deviation and so on. But the present definition, although it may appear to satisfy the test of coextensiveness, does not shed light on the role of an adjunct as an obstruction to inference. So it is inferior to earlier definitions.

If one overlooks the said crucial role of an adjunct, it would also be difficult to avoid acknowledging bois as an adjunct even if one has recourse to particular definitions of adjuncts as pervading particular probanda and not pervading particular marks. For example, in inferring smoke from fire (that is a faulty inference vitiated by the well-known adjunct of wet fuel), one could offer the following supportive CR in favor of the claim that bois pervades smoke (and so should be regarded as an adjunct): if smoke deviates from "being other than the inferential subject," it would be the inferential subject and so on.

> Text. *Kecit tu sādhana-vyāpakah api upādhih kvacit yatra pakṣa-avṛttih hetuh yathā karakā prthivī kathina-samyogāt iti atra anuṣṇa-aṣīta-sparśavattvam. Na ca tatra svarūpa-asiddhih eva doṣah, sarvatra upādheh dūṣaṇāntara-samkarāt iti ahuh*. (375)

> Tran. Some say that something that pervades the mark may also occasionally be an adjunct where the mark is absent in the inferential subject (e.g., having a touch that is neither hot nor cold in the inference that a hail is an earthen substance because of making a hard contact). Not that there that the mark does not belong to the inferential subject is alone the fault, for in all cases of adjuncts an overlap with some other fault is involved.

According to MN, Gangesa does not reject this view. Although an adjunct usually does not pervade the mark, in some cases even something that pervades the mark may be an adjunct. For example, in inferring that the lake has fire because of smoke, the causal conditions of fire may be accepted as an adjunct. The causal conditions of fire pervade smoke, the mark, for there is no smoke without fire. The causal conditions of fire as well as fire are absent in the inferential subject. But that raises no concern, for smoke, the mark, too is absent in the inferential subject. One could object that since in such a case the mark does not belong to the subject, that is already recognized as a fault and it is unnecessary to recognize it as a case of an adjunct. But the objection is not persuasive, for other faults crop up in other cases of adjuncts as well.

However, such features that pervade the mark could easily be treated separately from adjuncts in the stricter sense of those that pervade the refined probandum and do not pervade the mark. This may be a reason why Gangesa presents this view as that of someone and not as his own view.

Text. *Sādhyam ca na upādhih vyabhicāra-sādhane sādhya-aviśiṣṭatvāt anumiti-mātra-uccheda-prasañgāt ca*. (376)

Tran. And the probandum is not an adjunct, for then the probandum would be indistinguishable (from the mark) in proving deviation and further as a consequence all inferences would be undermined.

If there is an adjunct, absence of the adjunct serves as the ground for inferring absence of the probandum. If the adjunct were none other than the probandum itself, the probans and the probandum become indistinguishable, for then absence of the probandum would be both the probans and the probandum of the said inference.

Further, if the probandum itself is an adjunct and provides the ground for absence of the probandum while the goal of the inference is to prove the presence of the probandum, the very foundation of inferring is jeopardized.

8

Classification of Adjuncts: *Upādhivibhāgah*

Text. *Sah ca ayam dvividhah niścitah sandigdhah ca. Sādhya-vyāpakatvena sādhana-avyāpakatvena ca niścitah vyabhicāra-niścaya-ādhāyakatvena niścita-upādhih, yathā vahnimattvena dhūmavattve sādhye ārdrendhana-prabhava-vahnimattvam*. (378)

Tran. And that is of two kinds: certain or suspected. That which is known with certainty to pervade the probandum and not to pervade the mark is a certain adjunct, for it implies deviation with certainty (e.g., being a fire produced by wet fuel in inferring smoke from fire).

If the mark is more extensive than something that is not less extensive than the probandum, it follows necessarily that the mark is more extensive than the probandum or that the mark is deviant. An adjunct that provides thus a certain ground for deviation is called a certain adjunct.

This may be also explained as a modal law by letting P, A and M stand respectively for the probandum, the adjunct and the mark:

It is certain that all P is A.
It is certain that some M is not A.
Therefore, it is certain that some M is not P.

In other words, if two premises jointly imply a conclusion in a formally valid way, if both premises are certain, so is also the conclusion.

Text. *Yatra sādhana-avyāpakatva-sandehah sādhya-vyāpakatva-samśayah vā tat-ubhaya-sandehah vā tatra hetu-vyabhicāra-samśāyakatvena sandigdha-upādhih, yathā mitrā-tanayatvena śyāmatve sādhye śāka-āhāra-pariṇatijatvam*. (378–79)

Tran. In a case where there is doubt over that the mark is not pervaded or there is doubt over that the probandum is pervaded or there are both doubts, there is a suspected adjunct by way of providing the ground for the suspicion that the mark is deviant (e.g., being due to the consumption of certain vegetables in inferring dark complexion from being a child of Mitra).

If it is not certain that the adjunct does not pervade the mark or it is not certain that the adjunct pervades the probandum or both, it does not follow logically that the mark deviates from the probandum but there is still sufficient reason to cast doubt on the claim that the mark is pervaded by the probandum.

The above text may be explained as implying the following modal laws:

(1) It is possible that the adjunct does not pervade the mark.
It is certain that the adjunct pervades the probandum.
Therefore, it is possible that the mark deviates from the probandum.

(2) It is certain that the adjunct does not pervade the mark.
It is possible that the adjunct pervades the probandum.
Therefore, it is possible that the mark deviates from the probandum.

(3) It is possible that the adjunct does not pervade the mark.
It is possible that the adjunct pervades the probandum.
Therefore, it is possible that mark deviates from the probandum.

RS observes that this is so because the doubt about the pervaded is a ground for doubt about the pervader [*Vyāpya-samśayasya vyāpaka-samśaya-hetutvāt*, RS in GD 1047]. GD comments that deviation pervades having adjuncts and doubt about the latter is a ground for doubt about the former [*Vyāpya-samśaya-vidhayā vyabhicāra-vyāpya-sopādhitva-samśayasya tat-samśaya-ādhāyakatvam*, GD 1047]. That is, all cases in which the concomitance of the mark with the probandum is dependent on an adjunct are cases of deviation. Hence the suspicion of an adjunct leads to suspicion of deviation. In other words, the said modal laws are based on the formal truth that the presence of an adjunct necessarily implies deviation. Thus both varieties of modal laws involving certainty or possibility are based on the said formal truth.

Text. *Na ca tena eva hetunā śāka-pākajatvam api sādhyam, tatra śyāmatvasya upādhitvāt ubhayasya api arthāntaram śyāmatva-mātre hi vivādah na tu ubhayatra*. (379)

Tran. Being due to consumption of some vegetables is not then the probandum and that (being a child of Mitra) is not also the mark, for dark complexion is an adjunct and there is fault of changing the subject in trying to prove both; indeed, the dispute is only over dark complexion and not over both.

This passage refers back to the previous passage with the familiar example of inferring dark complexion from being a child of Mitra. In this inference, being due to the consumption of some vegetables is an adjunct. Can the adjunct be avoided if (instead of dark complexion) being due to the consumption of some vegetables is the probandum while the mark remains the same? No, says Gangesa, for then dark complexion is an adjunct. What if both dark complexion and being due to the consumption of some vegetables are together the probandum? Even then, says Gangesa, there is fault of changing the subject, for the intended probandum is dark complexion and not both dark complexion and being due to consumption of some vegetables.

It has been said in the previous chapter that the probandum is not an adjunct. One could ask if adjuncts are avoided in the said inference by making both dark complexion and due to the consumption of some vegetables the probandum. That is, we have here two properties each of which is an adjunct in inferring the other from the same mark. Do they cease to be adjuncts with respect to each other merely by the formal move of making both together the probandum? No, says MN, for there is no bar to each being an adjunct with respect to the other regarding a given part of the said inference [*Yugapat ubhayasya sādhane api eka-amśe aparasya upādhitvena udbhāvane bādhaka-abhāvāt*, MN 379]. RS adds that not only then can each be an adjunct for the other but also each can be an adjunct in inferring both [*Ubhaya-iti. Eka-amśe aparasya eka-viśiṣṭa-apara-sādhyatayam tu ekaikasya upādhitvam*, RS in GD 1056].

Text. *Na ca evam dhūmat vahni-anumāne api vahni-sāmagrī upādhih syāt, vahninā iva tat-samagryā api samam dhūmasya anaupādhikatva-niścayāt. Atra tu mitrā-tanayatva-vyāpya-śyāma-sāmagryā sthātavyam iti atra kārya-kāraṇa-bhāva-ādīnām vyāpti-grāhakānām abhāvāt*. (379–80)

Tran. It should not be (said) that in this way the causal conditions of fire too is an adjunct in inferring fire from smoke, for there it is certain that (the relation) between smoke and the causal conditions of that, like (the relation) between smoke and fire, is free from adjuncts. On the other hand, in this case that being a child of Mitra is pervaded by the causal conditions of dark complexion should be established; however, grounds of generalization such as the relation of effect and causal condition are not available.

One could wonder if there is the fear of an adjunct even in a reliable inference like that of fire from smoke. The fear stems from the question if the causal conditions of the probandum could be adjuncts. If there were such a fear and it could not be eliminated, the whole architecture of empirical reasoning would be threatened. So Gangesa argues against such fear. He points out a crucial difference between a reliable inference and an inference with a suspected adjunct. In the former the pervasion between the probans and the probandum is known

with certainty. This certainty is derived from supportive counterfactual reasoning. The latter in this case is available partly because it is known that fire is a causal condition of smoke and based on that the pervasion between smoke and the causal conditions of fire is also known. But this is not so with the case of a suspected adjunct like the inference of dark complexion from being a child of Mitra. It is not known that consumption of certain vegetables is a causal condition of dark complexion. So, requisite grounds for induction including supportive CR are not available. Thus there is no obstruction to the suspicion of deviation in the latter case while there is such obstruction in the former case.

> Text. *Ata eva sādhya-sāmagryā saha hetoh api yatra vyāpti-grāhakam asti tatra sāmagrī na upādhih, yatra tu tat nāsti sā api upādhih iti abhisandhāya sāmagrī ca kvacit na upādhih na tu sarvatra iti uktam.* (380)

> Tran. Hence where the ground for generalization between the mark and the causal condition of the probandum is available, there the causal condition (of the probandum) is not an adjunct, but where that is not available, that (the causal condition of the probandum) too is an adjunct. Thinking this is said that the causal condition is not sometimes an adjunct though this is not so always.

Whether the causal condition of the probandum is an adjunct depends on whether requisite grounds for pervasion between the mark and such causal condition are available.

> Text. *Yathā tulya-yogakşemayoh upādheh vyāpakata-sandehe īśvara-anumāne śarīrajanyatva-aṇutva-ādih, yathā ca śāka-pākajatvasya sādhya-vyāpakatā-sandehe mitrā-tanayatve.* (381)

> Tran. For example, in a case of functional equivalence being produced by the body or being an atom and so on are adjuncts in inferring God out of suspicion over pervasion (of the probandum) by the adjunct and, similarly, being due to the consumption of (certain) vegetables is an adjunct for being a child of Mitra out of suspicion over pervasion of the probandum (by the adjunct).

The first example refers to the inference that a dyad (that must be the first product given the Nyāya atomic theory) has a causal agent (*sakartṛka*) because of being an effect like a pot. In this inference being produced by the body is an adjunct (in the Mīmāmsā view but not in the Nyāya view). In the Mīmāmsā view there are grounds for the generalization that all things having causal agents are produced by embodied agents though it is not true that all effects are produced by embodied agents. Thus being produced by something with a body pervades the probandum, viz., having a causal agent, and does not pervade the mark, viz., being an effect. Accordingly, the inference is faulted by an

adjunct. Needless to say, an embodied God would serve no purpose for the Nyāya and the inference is effectively blocked (in the Mīmāmsā view).

In the second example, it is not known that eating certain vegetables is a causal condition of dark complexion. So it is not certain that the former pervades the latter, the probandum. Still, there is the surmise that the former could contribute to the latter and thus the former is a suspected adjunct.

Text. *Yat tu upādhi-sandehah na upādhih na vā hetvābhāsāntaram iti tat-udbhāvane niranuyojya-anuyoga iti. Tat na. Sandigdha-anaikāntikavat vyabhicāra-samśaya-ādhāyakatvena dūṣakatvāt upādheh iva vyabhicāra-niścaya-ādhāyakatayā.* (381–82)

Tran. It is not that suspicion of an adjunct is neither an adjunct nor another (new) pseudo-probans so that allegation of that amounts to an improper accusation. For it is a fault by implying suspicion of deviation like a suspected inconclusive mark and like a (certain) adjunct implying certain deviation.

One could object that suspicion of an adjunct is neither an adjunct nor a new kind of pseudo-probans. That is, one could accept a certain adjunct as a fault but not a suspected adjunct. This objection springs from the viewpoint that something that is itself doubtful cannot render something else doubtful.

Gangesa does not agree. Suspicion of an adjunct is a sufficient basis for suspicion of deviation and that is a sufficient basis for denying that the inference is reliable. This is because if one or more of the premises of an inference are doubtful, so is also the conclusion. To support his view he cites the case of a suspected inconclusive mark. A mark is inconclusive if it deviates from the probandum. A suspected inconclusive mark is suspected to deviate from the probandum (as distinguished from a certain inconclusive mark that is certainly known to deviate from the probandum). If a suspected inconclusive mark is a fault, so is also a suspected adjunct. Of course, there is still a difference between a certain adjunct and a suspected adjunct. As their very names imply, in the case of a certain adjunct, deviation is certain while in the case of a suspected adjunct deviation is suspected.

EARLIER VIEWS OF WHY AN ADJUNCT IS A FAULT: *UPĀDHERDŪṢAKATĀBĪJAPŪRVAPAKṢAH*

Text. *Idānīm upādheh dūṣakatā-bījam cintyate. Na api asya sva-vyatireka-dvārāsat-pratipakṣatvena dūṣakatvam, tadā hi sat-pratipakṣe sat-pratipakṣāntaravat upādheh udbhāvanam na syāt. Na ca pratipakṣa-bāhulyena adhika-bala-artham udbhāvanam, śatam api andhanam na paśyati iti nyāyāt ekena api bahūnām pratibandhāt ca , vyāpti-pakṣadharmate balam tat ca tulyam eva, na tu bhūyastvam*

> *api, ekasmāt anvamiteh sandigdha-upādheh adūṣakatā-pātāt ca tat-vyatirekasya sandigdhatvāt*. (383–86)

> Tran. The ground for an adjunct being a fault is now under consideration. It is not that it is a fault by virtue of counterbalancing (by showing that the probandum is absent in the inferential subject) based on its own absence (in the inferential subject). For then the introduction of an adjunct would be uncalled for just like another rival mark when there is a counterbalancing mark. It is not that the introduction of (an adjunct) is for the sake of adding more support (or strength: *balam*) in a case where there are many rival (marks), for, as the common saying (*nyāya*) goes, even a hundred blind persons cannot see, and even one (reliable fault) can obstruct many (rival marks). Further, pervasion and belonging to the inferential subject (i.e., that the mark is pervaded by the probandum and that the mark belongs to the inferential subject) are indeed the grounds (for inferring the probandum) and that is equivalent; on the other hand, plurality (of marks) is not (the ground) (i.e., the probandum cannot be reliably inferred merely because there are many marks irrespective of whether they are pervaded by the probandum and whether they belong to the inferential subject). Moreover, there is lack of awareness (of the probandum) even from one (fault). Again, a suspected adjunct would then cease to be a fault, for its absence is uncertain.

One may hold that an adjunct is a fault by way of counterbalancing. Since an adjunct pervades the probandum, absence of the probandum follows logically from absence of the adjunct. Thus one may argue that the probandum is absent in the inferential subject on the ground that the adjunct is absent in the inferential subject. In this inference of absence of the probandum in the inferential subject absence of the adjunct is the mark [*Sva-vyatireka-liñgaka-pakṣa-viśeṣyaka-sādhya-abhāva-anumiti-prayojakatayā*, MN 383]. Gangesa rejects this view on the ground that since then an awareness of being possessed of a mark that proves absence of the probandum is available, this renders an adjunct dispensable [*Sādhya-abhāva-sādhaka-hetumattā-jñāna-ātmaka-pratibandhaka-sadbhāvāt upādheh tatra . . . vyarthatvāt*, MN 384].

One could argue that an adjunct would still be useful if there were many rival marks. Gangesa disagrees. He points out that a mere plurality does not count. He gives the analogy of blind persons to drive it home. A blind person cannot see. Even if we have one hundred of them, still none of them can see. It does not make any difference whether we have one of them or one hundred of them: still no seeing takes place. Similarly, a mere plurality of (defective) marks makes no difference: the probandum is not proved. So one fault suffices for refutation and additional faults are superfluous. Indeed, one fault suffices to refute many such defective marks. Moreover, what really counts is whether a mark is pervaded by the probandum and belongs to the inferential subject. In case of counterbalancing both sides are equally matched in that respect.

Finally, adjuncts are of two kinds, certain and uncertain. In the latter case there is uncertainty over absence of the adjunct in the inferential subject. Hence there would be uncertainty over absence of the probandum in the inferential subject as well and thus both sides would not be equally matched as they should be in a case of counterbalancing. If counterbalancing is the proper story, since a suspected adjunct cannot provide that, the latter would have to be disqualified.

[In reading the portion of the above text that goes *ekasmāt api anvamiteh*, we have followed K. N. Tarkavagisa, the editor, and MN.]

Text. *Api ca evam bādha-unnīta-pakṣetarasya upādhitvam na syāt vyatireke asādhāraṇyāt*. (386–87)

Tran. Moreover, in this way being other than the subject in a case where the mark is countermanded would not be an adjunct, for the absence (suffers from) uniqueness (*asādhāraṇya*).

Gangesa gives another reason for rejecting that an adjunct always leads to counterbalancing. He has already argued that although "being other than the subject" is not often an adjunct, it is an adjunct where the mark is countermanded. Now he points out that such an adjunct does not fit the above account, for its absence is necessarily unique to the inferential subject and missing in all cases where the probandum is certainly known to be present.

Text. *Pakṣavṛttiśca upādhih na syāt yathā ghatah anityah dravyatvāt iti atra kāryatvam andhakārah dravyam svātantryeṇa pratīyamānatvāt iti atra aśrāvaṇatvam tadvyatirekasya pakṣa-avṛttitvāt. Na ca na ayam upādhih, tallakṣanasattvāt anyathā dūṣakatva-sambhavāt ca*. (387–88)

Tran. And that which belongs to the inferential subject would not count as an adjunct—for example, being an effect with reference to (the faulty inference that) a pot is non-eternal because of being a substance or not being audible with reference to (the faulty inference that) darkness is a substance because of being something that is independently grasped, for absence of these do not belong to the inferential subject. It is not also that these are not adjuncts, for these fulfill the definition of that and that these are faults is explicable otherwise.

Gangesa offers another objection to the view that all adjuncts lead to counterbalancing. Such counterbalancing is sought to be achieved by virtue of absence of the adjunct in the inferential subject. But an adjunct is not always absent in the inferential subject. In some cases an adjunct is present in all inferential subjects. In the latter case, such counterbalancing is accordingly ruled out. In the first example, being an effect pervades being non-eternal, the probandum, but

does not pervade being a substance, the mark. Thus it satisfies the definition of an adjunct. However, all pots are effects and thus the adjunct is present in all inferential subjects. Hence in this case absence of the probandum in the inferential subject cannot be truthfully inferred from absence of the adjunct in the inferential subject. In the second example, inaudibility pervades being a substance, the probandum, for in the Nyāya view only sound is audible and sound is not a substance. Again, sound is independently grasped but is not inaudible; inaudibility thus does not pervade the mark. Accordingly, the definition of an adjunct applies to inaudibility in such an inference. Still, inaudibility pervades the inferential subject, for darkness is never audible. So here too absence of the probandum in the inferential subject cannot be truthfully inferred from absence of the adjunct in the inferential subject.

> Text. *Kim ca sādhya-vyāpya-avyāpakatvena upādheh sādhya-avyāpakatve tad-vyatirekena katham satpratipakṣah, na hi avyāpaka-vyatirekāt avyāpya-vyatirekah.* (388–89)

> Tran. Moreover, if an adjunct fails to pervade the probandum because of failing to pervade what is pervaded by the probandum, how can there be counterbalancing from the absence of that? Indeed, negation of what is not pervaded does not follow from negation of what is not pervasive.

Gangesa offers yet another objection to the view that an adjunct always leads to counterbalancing. He refers to the case where it is known that the mark is pervaded by the probandum. In such a case absence of the probandum in the inferential subject does not validly follow from absence of the adjunct in the inferential subject, for absence or negation of what does not pervade does not imply absence or negation of what is not pervaded. Inference of absence or negation of what is not pervaded from absence or negation of what is not pervasive is formally invalid and Gangesa explicitly recognizes that.

> Text. *Na api vyāpti-viraha-rūpatayā, asiddhatvena anaupādhikatvasya vyāptitva-nirāsāt* (389)

> Tran. It is not also that (an adjunct is a fault) by way of negation of pervasion, for it has been shown, on the ground of lack of substantiation, that pervasion is not the same as being devoid of adjuncts.

If pervasion were the same as being devoid of adjuncts, having adjuncts would have meant negation of pervasion. But Gangesa has earlier rejected the view that being pervaded is the same as being devoid of adjuncts.

> Text. *Na api anaupādhitva-jñānasya vyāpti-dhī-hetutvasya tattvena vyāpti-jñāna-kāraṇa-vighatakatayā vyāpyatvāsiddheh antarbhāvah, na hi anyasya*

sādhyavyāpakatva-sādhānavyāpakatvajñānam anyasya vyāpti-jñāne svatah pratibandhakam iti uktam. (389)

Tran. It is not also that since awareness of being devoid of adjuncts is a causal condition of awareness of pervasion, (an adjunct) should be classified under *vyāpyatva-asiddha* for the reason that it is an obstruction to a causal condition of awareness of pervasion. Indeed, it has been said that awareness that something pervades the probandum and does not pervade the mark does not directly obstruct awareness that something else is pervaded.

One may hold that awareness of being devoid of adjuncts is a causal condition of awareness of pervasion. Then one may hold further that an adjunct is an obstruction to a causal condition of awareness of pervasion and should be classified as a pseudo-probans of the subtype called *vyāpyatvāsiddha* under the type called *asiddha*. Gangesa disagrees on the ground that awareness of an adjunct not pervading the mark and pervading the probandum does not directly obstruct the awareness that the mark is pervaded by the probandum. He implies that only something that is a content of an awareness that directly obstructs a kind of inference or a causal condition of that kind of inference should be classified as a pseudo-probans (*hetvābhāsa*).

Text. *Na ca sādhya-vyāpaka-avyāpyatva-jñāne vidyamāne sādhanasya sādhya-vyāpyatva-jñānam na utpattum arhati iti vācyam. Na hi sādhya-vyāpaka-vyaāpyatva-jñānam vyāpti-jñāna-kāraṇam yena tat-pratibandhakam syāt, kintu sādhya-vyāpaka-vyabhicāritvena sādhya-vyabhicāritva-jñāna-dvārā*. (389–91)

Tran. One should not also say this: if there is awareness that (the mark) is not pervaded by what pervades the probandum, there should not be awareness that (the mark) is pervaded by the probandum. Indeed, awareness of being pervaded by what pervades the probandum is not a causal condition of awareness of pervasion; so that should be an obstruction. Rather, (there is obstruction) by way of awareness of deviation from the probandum because of deviation from what pervades the probandum.

One may argue that an adjunct directly obstructs awareness of pervasion that is a causal condition of a kind of inference. Since the adjunct pervades the probandum but does not pervade the mark, it is known that the mark is not pervaded by what pervades the probandum. Accordingly, there should not then be awareness that the mark is pervaded by the probandum. Gangesa disagrees. He points out that awareness of being pervaded by what pervades the probandum is not a causal condition of awareness of being pervaded by the probandum. This is because awareness of something being pervaded by something may take place even if there is no awareness of the

former being pervaded by what pervades the latter. He adds that awareness of pervasion by the probandum is obstructed by awareness of deviation from the probandum. The latter, in the present context of an adjunct, is based on deviation from what pervades the probandum. Since the mark deviates from the adjunct that pervades the probandum, it does follow necessarily that the mark deviates from the probandum. But that follows indirectly and not directly.

> Text. *Na api vyabhicāra-unnāyakatvena, yathā hi sādhya-vyāpaka-vyabhicāritayā sādhanasya sādhya-vyabhicāritvam anumeyam tathā sādhya-vyāpya-vyabhicāritvena sādhya-vyabhicāritvam upādheh api anumeyam vyāpti-grāhaka-sāmyāt*. (391)

> Tran. It is not also that (an adjunct is a fault) by way of showing deviation. Just as it may be inferred that the mark deviates from the probandum because of deviating from what pervades the probandum, so also it may be inferred that the adjunct does not pervade the probandum because of not pervading what is pervaded by the probandum, for the grounds of generalization are equivalent.

One may argue that an adjunct is always a fault by way of showing that the mark deviates from the probandum. This is rejected on the following ground. On the one hand, it does follow that the mark deviates from the probandum for the reason that it deviates from the adjunct that pervades the probandum. But on the other hand, it may also be known in some cases that the mark is pervaded by the probandum. In such a case, since the mark that is pervaded by the probandum deviates from the adjunct, it follows that the adjunct does not pervade the probandum. This inference is formally valid and may be reformulated as below where M, P and A stand respectively for the mark, the probandum and the adjunct.

Some M is not A.
All M is P.
Therefore, some P is not A.

Thus there is doubt about whether the adjunct pervades the probandum or not and, accordingly, there is doubt about whether the mark is deviant or not. As Gangesa notes, observational evidence for both sets of premises may be equivalent and one may not have a decisive reason to choose one over the other.

[The above text contains the following passage: *sādhya-vyāpya-vyabhicāritvena sādhya-vyabhicāritvam upādheh api anumeyam*. This could be read as: it may be inferred that the adjunct deviates from the probandum because of deviating from what is pervaded by the probandum. This inference

is formally invalid. But it is not necessary to read the text in this way. As RS and GD point out, both *sādhya-vyāpya-vyabhicāritva* and *sādhya-vyabhicāritva* may be construed as cases of Bahuvrīhi compound. Then staying within the rules of Sanskrit grammar the text may be read literally as above. The principle of charity favors the reading of RS and GD: *Sādhya-vyāpya-vyabhicāritvena sādhya-vyabhicāritvam iti ubayatra eva bahuvrīhih*, RS in GD 1064; *Sādhya-vyāpya-vyabhicāri yasya iti bahuvrīhinā tṛtīyāntasya vyāpya-avyāpakatvena iti arthah, sādhyam vyabhicāri yasya iti bahuvrīhinā caramapadasya sādhya-avyāpakatam iti arthah,* GD 1064.]

Text. *Na api sādhya-vyāpaka-avyāpyatvena vyāpti-viraha-unnāyakatayā, sādhya-vyāpya-avyāpakatvena upādheh eva sādhya-avyāpakatva-sādhanat.* (392)

Tran. It is not also that (an adjunct is a fault) by way of showing lack of pervasion on the ground that (the mark) is not pervaded by (the adjunct) that pervades the probandum, for it follows that the adjunct does not pervade the probandum for the reason that (the adjunct) does not pervade (the mark) that is pervaded by the probandum.

The point made here is similar to that made in the previous passage: the latter speaks of deviation and the present passage speaks of lack of pervasion: deviation and lack of pervasion are similar in meaning though they are not the same. Since deviation and lack of pervasion are different, Gangesa should not be accused of merely repeating something here. It will be explained in the next chapter that lack of pervasion differs from deviation.

Text. *Tasmāt upādhih hetvābhāsāntaram iti.* (392)

Tran. Hence an adjunct is a different kind of pseudo-probans.

The contender as a spokesman of an earlier point of view argues that an adjunct is different from the five kinds of recognized pseudo-probans. It has been discussed why an adjunct should not be classified under counterbalancing. Then it has also been discussed why an adjunct does not directly show deviation or lack of pervasion and so on. Adjuncts should not be classified under other kinds of pseudo-probans called the countermanded (*bādhita*) and so on either. The common feature of all the recognized five kinds of pseudo-probans is that they are contents of an awareness that directly obstructs either a certain kind of inference or a causal condition of that. An adjunct appears not to share that common feature. So an adjunct should be recognized as an additional kind of pseudo-probans that may involve as a consequence that the concept of a pseudo-probans needs to be revised or re-examined.

THE ACCEPTED VIEW OF WHY AN ADJUNCT IS A FAULT: *UPĀDHIDŪṢAKATĀBĪJASIDDHĀNTAH*

Text. *Ucyate. Ārdrendhanavattvādeh tarkādinā sādhyavyāpakatva-sādhanāvyapakatve niścite dūṣakatā-vīja-cintanam. Yadi ca sādhya-sādhana-sahacara-darśanena upādhau sādhya-vyāpakatā-niścayah eva nāsti tadā upādhitva-niścaya-abhāvāt dūṣakatā eva na asti iti kva vahirbhāva-antarbhāva-cintā*. (393–94)

Tran. This is to be said (or accepted on the subject why an adjunct is a fault). When having wet fuel, etc., are certainly known with the help of CR and so forth to pervade the probandum and not to pervade the mark, there is deliberation on the root of the fault. If after the observation of co-presence of the mark and the probandum there is no ascertainment that the adjunct pervades the probandum, then it is not sure that there is an adjunct, and so no fault crops up: then where is the room for deliberation on exclusion or inclusion (i.e., being the content of awareness that directly or indirectly obstructs a kind of inference, MN 394).

A distinction should be drawn between cases where CR and so on are available to show that the adjunct pervades the probandum and so on and cases where CR and so on are not available to show that. In the latter case, the determination that an adjunct is involved is not likely if in such a case the mark is also observed to be co-present with the probandum and the possibility that the mark is pervaded by the probandum is not ruled out. So such cases should be treated differently from those in which an adjunct is certain.

However, Gangesa also recognizes suspected adjuncts as he has stated before and as he will state again soon. So the above text should be construed as drawing our attention to the paradigmatic case and should not be taken to exclude suspected adjuncts. In other words, the reason why an adjunct is a fault should also be explored even where it is not certain that the adjunct pervades the probandum or does not pervade the mark.

Text. *Kim ca satpratipakṣatayā vyāpyatvāsiddatayā svātantryeṇa vā yadi doṣatvam sarvathā sādhya-vyāpakatā-niścayah vaktavyah tena vinā teṣām abhāvāt*. (394)

Tran. Moreover, if (an adjunct) is a fault by way of counterbalancing or being a case of unsubstantiated pervasion (*vyapyatvāsiddha)* or a separate reason, in each case the ascertainment that (the adjunct) pervades the probandum should be stated, for those are not possible without that.

Gangesa has discussed in the previous chapter the grounds for an adjunct being a fault by way of counterbalancing or showing deviation or lack of pervasion and criticized them. This opens the possibility that an adjunct may be a separate kind of pseudo-probans. Right now he makes it clear that none of

these three possibilities regarding why an adjunct is a fault are actually ruled out. But for any of these three possibilities, an adjunct needs to be pervasive of the probandum. So the first priority in the determination that an adjunct is a fault for one of these three reasons is to see if there are adequate grounds for claiming that the adjunct pervades the probandum.

MN explains that an adjunct, first, may become a fault by way of counterbalancing in that an adjunct may promote the inference of absence of the probandum in the inferential subject on the ground that there is absence of the adjunct in the inferential subject [*Satpratipakṣatayā iti sva-vyatireka-liñgaka-sādhya-abhāva-anumiti-prayojakatayā*, MN 394]. Second, an adjunct may become a fault by way of rejection of pervadedness in that it may promote the awareness that the mark is not pervaded (by the probandum) [*Vyāpyatva-asiddhatayā iti . . . hetu-viśeṣyaka-vyāpti-abhāva-prakāraka-jñāna-prayojakatayā*, MN 394]. Third, an adjunct may become a fault for a separate reason in that it may promote the inference that the mark is not pervaded by the probandum on the ground that the mark is not pervaded by the adjunct (that pervades the probandum) [*Svātatryeṇa vā iti . . . svavyāpyatvaliñgaka-hetupakṣaka-sādhyavyāptivirahānumiti-prayojakatvam*, MN 394].

> Text. *Tasmāt upādhi-niścayāt vyabhicāra-niścayah tat-samśayāt tat-samśaya iti vyabhicāra-jñānadvārā sādhya-vyāpaka-avyāpyatvena vyāpti-viraha-unnāyakatayā vā upādheh dūṣakatvam*. (394–95)

> Tran. Therefore, from ascertainment of an adjunct there is ascertainment of deviation and from suspicion of that (an adjunct) there is suspicion of that (deviation). Thus an adjunct is a fault by way of awareness of deviation or by way of showing lack of pervasion on the ground that (the mark) is not pervaded by that which pervades the probandum.

Just as ascertainment of deviation is the root of what makes ascertainment of an adjunct a fault, so also suspicion of deviation is the root of what makes the suspicion of an adjunct a fault [*Yat-niścayadvārā upādhitva-niścayasya dūṣakatvam tat-samśayadvārā tat-samśayasya api tathātvam*, RS in GD 1065]. Since the above passage of Gangesa is in the section on the accepted view, it is clear that both ascertainment and suspicion of an adjunct are faults in Gangesa's view. Both ascertainment and suspicion of an adjunct promote awareness of deviation. Ascertainment of an adjunct (*upadhi-niscaya*) promotes ascertainment of deviation (*vyabhicāra-niścaya*) and suspicion of an adjunct promotes suspicion of deviation (*vyabhicāra-samśaya*).

MN explains that an adjunct may be a fault by way of awareness of deviation in that an adjunct may promote the internal perception of deviation. In such internal perception of deviation awareness of the adjunct is the aware-

ness of the specific factor and thus an adjunct promotes that as a content of that awareness of the specific factor [*Vyabhicārajñānadvārā iti mānasa-vyabhicāra-pratyakṣa-prayojakatayā . . . mānasa-vyabhicāra-niścaye upādhi-jñānasya viśeṣa-darśanatayā upayogitvena tadviṣayatayā upādheh api tatra prayojakatvāt*, MN 394].

MN explains that an adjunct may be a fault because of the mark not being pervaded by what pervades the probandum in that it may promote the inference that the mark is not pervaded by the probandum on the ground that the mark is not pervaded by the adjunct that pervades the probandum. In the inference that the mark is not pervaded by the probandum "that the mark is not pervaded by what pervades the probandum" (more specifically, that the mark is not pervaded by what is specified by the nature that is the specifier of the fact of pervading the probandum) is the mark [*Sādhya-vyāpaka-avyāpyatvena iti svaniṣṭha- sādhya-vyāpakatā-avacchedaka-rūpa-avacchinna-avyāpyatvena hetunā hetau sādhyavyāptiviraha-anumiti-prayojakatayā*, MN 394].

MN adds that both of the above, viz., internal perception of deviation or inference of deviation, are possible only if it is certain that an adjunct is involved. On the other hand, if an adjunct is suspected, there is sometimes suspicion of deviation or suspicion of lack of pervasion [*Etat ca upādhitva-niścayam adhikṛtya, upādhitva-samśayasya tu sādhya-vyabhicāravat sādhya-vyāpti-virahasya api samśayam prati eva kvacit prayojakatvam*, MN 394].

MN adds further that here pervasion is understood in the sense of the mark being present where the probandum is present and the mark not being present in what is other than that which is possessed of the probandum [*Atra sādhya-vyāpti-viraha-padam sādhyavat-anya-avṛttitva-viśiṣṭa-sādhyavat-vṛttitva-rūpa-vyāpti-viraha-param*, MN 394–95]. This is also similar to one of the ways in which the nature of pervasion here is explained by RS. Alternatively, RS explains the lack of pervasion as the lack of the nature that is the specifier of the fact of being related to (i.e., pervaded by) the probandum [*Vyāpti iti. Sādhya-sambandhitā-avacchedaka-rūpa-virahah . . . sādhyavat-anya-avṛttitva-viśiṣṭa-sādhyavat-vṛttitva-virahah vā unneyah*, RS in GD 1066]. GD remarks that the first view endorsed in some ways by both MN and RS is the preferred view. GD also remarks that this makes clear that deviation and lack of pervasion are not the same [*Etādṛṣa-vyāpti-virahah na vyabhicāra-rūpah*, GD 1067]. Gangesa has said above that an adjunct becomes a fault by way of promoting awareness of deviation or lack of pervasion. Since deviation and lack of pervasion are different, Gangesa cannot be charged with useless repetition.

Both MN and RS comment in similar though not identical terms that in this context pervasion should not be construed in the familiar sense of being co-located with the probandum that is not the negatum of an absolute absence that is co-located with the mark or, accordingly, lack of pervasion should not

be understood as being related to a probandum that is the negatum of an absolute absence that is co-located with the mark [*Na tu sva-vyāpaka-sādhya-sāmānādhikaraṇya-rūpa-vyāpti-param*, MN 395; *Na tu sva-samānādhikaraṇa-atyanta-abhāva-pratiyogi-sādhyakatvam*, RS in GD 1066].

RS comments that some "new" thinkers hold that (1) a mark may be inferred to deviate from the probandum on the ground that the mark deviates from the adjunct that pervades the probandum and (2) that the probandum may be inferred not to pervade the mark on the ground that the probandum is pervaded by the adjunct that does not pervade the mark [*Sādhya-vyāpaka-upādhi-vyabhicāritvena hetau sādhya-vyabhicāritvam sādhana-avyāpaka-upādhi-vyāpyatvena sādhye sādhana-avyāpakatvam anumeyam iti tu navyāh*, RS in GD 1066]. Both of these inferences are formally valid. The first has been reformulated before. The second may be restated as follows:

The probandum is pervaded by the adjunct.
The adjunct does not pervade the mark.
Therefore, the probandum does not pervade the mark.

This argument is now reformulated below with A, M and P standing respectively for the adjunct, the mark and the probandum.

All P is A.
Some M is not A.
Therefore, some M is not P.

Text. *Yat vā sādhya-vyāpaka-abhāvavat-vṛttitayā sādhya-vyabhicāritvam unneyam*. (395–96)

Tran. Alternatively, it may be shown (in a case of an adjunct) that (the mark) deviates from the probandum on the ground that (the mark) is present where there is absence of (the adjunct) that pervades the probandum.

This is yet another way of explaining why an adjunct is a fault. Here that the mark deviates from the probandum is inferred on the ground that an adjunct is involved. Thus an adjunct is a fault by way of promoting such an inference of deviation [*Tathā ca kvacit sādhya-vyabhicāra-anumiti-prayojakatayā api upādheh dūṣakatvam*, MN 395]. Since this is a case of inference of deviation, this takes place when it is certain that an adjunct is involved [*Etat api niścaya-daśām adhikṛtya*, MN 395]. This inference is also a formally valid argument and may be restated as below:

The adjunct pervades the probandum.
The mark deviates from the adjunct.
Therefore, the mark deviates from the probandum.

This argument may also be symbolized in the immediately above form. Although the two arguments may be formally stated in the same way, they are still different arguments, so the charge of useless repetition is avoided.

MN says that the above account of why an adjunct is a fault holds if an adjunct is understood as that which pervades the intended probandum and does not pervade the mark [*Idam ca paryavasita-sādhya-vyāpakatve sati sādhana-avyāpakatva-rūpa-upādhi-jñānasya dūṣakatā-vījam*, MN 395].

But the situation is different, MN says, if we have an adjunct that pervades the probandum as specified by a feature (or the nature) of the inferential subject. Then the awareness that the adjunct is absent in the inferential subject may sometimes lead to counterbalancing and sometimes to countermanding [*Pakṣa-vṛtti-dharma-avacchinna-sādhya-vyāpakatve sati pakṣa-avṛttitva-rūpa-upādhi-jñānasya tu satpratipakṣa-unnāyakatvam kvacit bādha-unnāyakatvam ca dūṣakatā-vījam*, MN 395]. In a case of counterbalancing, such an adjunct promotes the ascertainment that in the inferential subject there is absence of the adjunct which absence is pervaded by absence of the probandum [*Satpratipakṣa-unnāyakatvam ca pakṣe sādhya-abhāva-vyāpya-upādhi-avhāvavattā-niścaya-prayojakatvam*, MN 395]. On the other hand, in a case of countermanding the said kind of adjunct promotes the ascertainment that in the inferential subject there is absence of the adjunct which absence is pervaded by absence of the probandum while there is no belief that the inferential subject is possessed of an equally matched mark that is pervaded by the probandum [*Bādha-unnāyakatvam ca pakṣe . . . tulya-bala-sādhya-vyāpya-hetumattā-niścaya-viraha-daśāyām pakṣe sādhya-abhāva-vyāpya-upādhi-abhāvavatta-niścayadvārā*, MN 395–96]. Thus the difference between cases of counterbalancing and countermanding (involving adjuncts) is that in the latter case there is no such belief that there is an equally good reason for holding that the probandum belongs to the inferential subject while there is such a belief in a case of counterbalancing. What both cases of counterbalancing and countermanding (involving adjuncts) share is that there is the belief that the probandum does not belong to the inferential subject for the reason that the adjunct does not belong to the inferential subject.

Text. *Na ca sādhana-abhāvavat-vṛttitvam upādhih iti vācyam. Upādhi-mātra-uccheda-prasañgāt satpratipakṣe pūrva-sādhana-vyatirekavat avṛtti-gaganādau sādhya-avyāpakatvāt samyogādau hetau sādhana-vyāpakatvāt ca*. (396)

Tran. It should not be said that an adjunct is present where there is absence of the mark, for then there is elimination of all adjuncts. This is similar to the situation of negation of the previous mark in a case of counterbalancing; also then there is lack of pervasion of the probandum with reference to gagana (the substratum of sound) and so on that do not reside in anything and there is pervasion of the

mark if conjunction (which is co-located with its absence in the same thing) and so on are the marks.

All adjuncts are eliminated in the sense that the inference that the mark is deviant from the probandum is then open to the possibility of an adjunct [*Tena api vyabhicāra-anumāne tatra api tathāvidha-upādhi-sambhavāt*, RS in GD 1066]. That is, if an adjunct pervades the probandum and does not pervade the mark, then that the mark deviates from the probandum does necessarily follow and may validly be inferred. But if an adjunct is present where the mark is absent, that the mark is deviant does not necessarily follow and inference of such deviation would then be open to the possible presence of an adjunct and be faulty. The analogy refers to cases of counterbalancing. If negation of the previous mark is an adjunct in a case of counterbalancing, since all cases of counterbalancing involve negation of the previous mark, all cases of counterbalancing would involve adjuncts.

The next point is with reference to the view accepted in the Nyāya ontology that the substratum of sound does not reside in anything. The last point refers to the accepted view of conjunction that it is a relation that is nonpervasive so that even if one composite thing is in conjunction with another thing in one part, that conjunction is restricted to that part and does not hold of other parts.

PSEUDO-ADJUNCTS: *UPĀDHYĀBHĀSANIRŪPAṆAM*

Text. *Atha upādhyābhāsāh. Asādhāraṇa-viparyayah, yathā anvaya-vyatirekini sādhye bādha-unnīta-anya-pakṣetaratvam*. (398)

Tran. Now the pseudo-adjuncts. (First) the absence of which is unique (*asādhāraṇa*)—for example, being other than the inferential subject when there is no countermanding and the probandum is related (to the mark) both by way of co-presence and co-absence.

Gangesa now discusses pseudo-adjuncts that share some features of an adjunct but still lack some required feature and, therefore, are not faults proper. The wording is similar to that of a pseudo-probans (*hetvābhāsa*). A pseudo-probans is similar to a probans in that the former has some features of a probans but still lacks some required feature and, therefore, is not a probans. A probans is capable of showing that the probandum belongs to the inferential subject. A pseudo-probans is not capable of that. On the other hand, presence of an adjunct proves that the inference is faulty. But a pseudo-adjunct falls short of that: an inference may not be faulty in spite of the presence of a pseudo-adjunct. The guiding insights for the exploration of pseudo-adjuncts

are similar to those for pseudo-probantia. Although an adjunct is a fault, it successfully blocks the inference of the probandum by way of showing absence of the probandum on the ground of absence of the adjunct itself. For an adjunct proper, the latter inference of absence of the probandum is a sound inference. Hence all the norms of a sound inference apply here and such an inference should be free from all the pseudo-probantia. Accordingly, Gangesa discusses the pseudo-adjuncts on the basis of the underlying principles for the pseudo-probantia themselves (or vice versa).

The first kind of pseudo-adjunct is the following. It is a feature absence of which is not co-located with absence of the probandum in any positive instance (*sapakṣa*) [*Asādhāraṇyam iha sarva-sapakṣa-vyāvṛttatvamātram sādhya-abhāva-rūpa-sādhyavat-avṛttitvam iti yāvat*, MN 398]. Since an adjunct pervades the probandum, it follows that if the adjunct is absent in the inferential subject, the probandum too is absent in the inferential subject. Thus, that the adjunct pervades the probandum implies that absence of the adjunct is pervaded by absence of the probandum. But the claim that absence of adjunct is pervaded by absence of the probandum is not reliable if the pervaded and the pervader are not observed together in any positive instance. Thus we have the first kind of pseudo-adjunct when such observation is ruled out. Take the familiar inference that the hill is fiery because it is smoky. This is not a case of countermanding, for absence of fire in the hill is not already reliably known. Now take the property of being other than the hill (that is a particular instance of bois). This property is a pseudo-adjunct for the said inference. Here a positive instance is something where absence of fire is certain. However, all nonfiery things like lakes are other than the inferential subject. Accordingly, absence of being other than the hill is not co-present with absence of fire in any positive instance. This suffices to cast doubt on the claim that being other than the hill pervades fire, the probandum, and hence disqualifies the said property from being an adjunct.

RS comments that the above kind implies that an adjunct is a fault by way of a counterinference (*idam satpratipakṣatvam abhipretya*, RS in GD 1073). The point is: the evidence to show that the probandum is pervaded needed for the counterinference is lacking (*satpratipakṣa-unnayana-aupayika-sādhya-vyāpakatva-grāhaka-pramāṇābhāve tātparyam*, RS in GD 1073).

Text. *Aprasiddha-sādhya-viparyayah, yathā kevalānvayini sādhye pakṣetaratvādih.* (398)

Tran. (Second) Where absence of the probandum does not occur anywhere—for example, being other than the inferential subject and so on if the probandum is omnilocated.

An omnilocated property like knowability is present in everything and its absence is not present anywhere. If then an omnilocated property is the probandum, absence of the probandum cannot be present anywhere. This may be analyzed as follows: in such a case absence in so far as it is specified by the specifier of probandumness is unreal (*saādhyasya sādhyatā-avacchedaka-rūpeṇa abhāvah alīkah*, MN 401). Alternatively, this may be analyzed as that the specifier of probandumness is not the specifier of negatumness of any constant absence (*atyantābhāva-pratiyogitā-anavacchedaka-sādhyatā-avacchedaka-avacchinna-sādhya*, MN 401). [The second analysis may be preferred to the first, for the second analysis avoids mentioning the complex (*guru*) idea of being unreal within the analysis.] Whenever the probandum is omnilocated and its absence does not occur anywhere, we have the second kind of pseudo-adjunct: here the possibility of an adjunct (that needs to be grounded in observation) is ruled out, for absence of the probandum cannot be observed together with absence of the putative adjunct in any positive instance. Now take the inference that a cow is knowable because it is nameable. Here being other than a cow (that is a particular instance of bois) is a pseudo-adjunct. An adjunct proper should pervade the probandum and, by transposition, absence of the adjunct should be pervaded by absence of the probandum. In this case absence of the adjunct amounts to being a cow, for absence of or difference from being other than a cow is equivalent to being a cow. Thus the transposed pervasion is: whatever is a cow is not knowable. This is clearly false. Further, knowability is everywhere. So its absence could not be observed together with being a cow in any positive instance. This suffices to render questionable that the probandum is pervaded by the putative adjunct, viz., that whatever is knowable is other than a cow. It should be clear that if the probandum is omnilocated, the very possibility of an adjunct is ruled out so that each and every thing can only be a pseudo-adjunct [*Kevalanvayi-sādhye . . . vastumātrasya eva upādhyābhāsatvāt*, MN 401].

Text. *Bādhita-sādhya-viparyayah, yathā vahnih uṣṇah tejastvāt iti atra akṛtakatvam.* (398)

Tran. (Third) where absence of the probandum (in the inferential subject) is countermanded—for example, not being a product in the inference that fire is hot because of the universal fieriness.

An adjunct blocks an inference by showing that the probandum is absent in the inferential subject on the ground that the adjunct is absent in the inferential subject. Absence of the probandum is inferred from absence of the adjunct. This latter inference should be reliable and be free from faults. For that to be possible absence of the probandum in the inferential subject should not

be already countermanded in a reliable way. If such absence is countermanded, there is no room for any doubt about presence or absence of the probandum that the inference can remove by offering a cogent reason. Gangesa points out that there are cases where absence of the probandum in the inferential subject is countermanded (i.e., it is already known in a reliable way that the probandum is present in the inferential subject). In such a case, no matter what is chosen as the adjunct, absence of the adjunct would fail to show in a reliable way that the probandum is absent in the inferential subject and, therefore, must be a pseudo-adjunct. An example of this third kind of pseudo-adjunct is the property of not being a product with reference to the inference that fire is hot because of the universal fieriness. The latter inference is accepted as sound. According to the Nyāya ontology, all things having the universal fieriness are hot. Fire has the universal fieriness and so fire is hot. [The Nyāya theory by the way is consistent with modern physical theory. To show this, however, would require discussion that is beyond the scope of this work.] Thus absence of the probandum of being hot in the inferential subject, viz., fire, is countermanded in this case. Accordingly, no matter what is offered as an adjunct its absence would fail to be a reliable ground for inferring absence of the probandum in the inferential subject. In the given example, not being a product too fails to show that fire is not hot, for fire is already known to be hot. It may be noticed that not being a product also fails to belong to a part of the inferential subject, for ordinary perceived fires are products (although according to the Nyāya ontology there are also fire atoms that are not products and so the mark does belong to a part of the inferential subject). This point is indeed taken up below in the discussion of the pseudo-adjunct of the fourth kind. But this is not an anomaly, for there is no bar to a pseudo-adjunct being faulty for additional reasons. This is similar to a pseudo-probans where one instance of a kind of pseudo-probans may also be an instance of some other kind of pseudo-probans.

It may be noted that in the above example not being a product does not pervade the probandum heat, for in the Nyāya view the heat in a fire atom is not a product. Not being a product also does not pervade the probans fieriness, for fieriness belongs to all fires, atomic or nonatomic. Thus not being a product fulfils one of the main features of an adjunct though not the other main feature. This is all right: not being a product is not an adjunct proper but a pseudo-adjunct; a pseudo-adjunct need not appear to have all the features of an adjunct. One should not also think that Gangesa is concerned with something like the fallacy of composition in recognizing this kind of pseudo-adjunct. His point rather is that any property or thing that may be offered as an adjunct would have to be a pseudo-adjunct if absence of the probandum in the inferential subject is countermanded. So his choice of not being a product as

an example of this kind of pseudo-adjunct is not of any great significance. In fact, there need not be a fallacy of composition in a case of a pseudo-adjunct of this kind. Consider, for example, the inference that water is cold because of waterness. Here fieriness (that does not pervade the probandum of being cold and also does not pervade the probans waterness) would be a pseudo-adjunct of this kind. According to the Nyāya ontology, it is reliably known that there is no absence of coldness in water, the inferential subject. So although absence of fieriness pervades the inferential subject (i.e., no water is a fire), it would still fail to show that there is absence of coldness in the inferential subject. Incidentally, *bādha* or countermanding need not be always a case of patent falsehood. From the Nyāya point of view, for example, to infer that water is not cold would amount to inferring something that is countermanded, for it is reliably known that water is cold. Still it would be too strong a claim to say that water is not cold is patently false, for sometimes water is felt as not cold. [When water is felt as not cold or even hot, this is explained by the Nyāya as being due to the admixture of other things that are not cold or are hot.]

Text. *Pakṣa-avyāpaka-viparyayah yathā kṣityādikam sakartṛkam kāryatvāt iti atra aṇu-vyatiriktatvam. Atra aṇu-vyatiriktatva-vyatirekasya kṣityādeh ekadeśavṛttyā bhāga-asiddheh.* (399)

Tran. (Fourth) where absence (of the property taken to be an adjunct) does not belong to a part of the inferential subject—for example, not being an atom with reference to the inference that the earth and so forth have a causal agent because of being products. Here since not being different from an atom or being an atom belongs to only to a part of the earth and so on (that is the inferential subject), there is (the flaw of) not belonging to a part (of the inferential subject).

Not belonging to the inferential subject (*svarūpa-asiddhi*) is a standard pseudo-probans. That is, if a mark fails to belong to the inferential subject, the mark also fails to prove that the probandum belongs to the inferential subject. This implies that if a mark does not belong to a part of the inferential subject, the mark also fails to prove that the probandum belongs to the whole inferential subject as intended. While not belonging to the inferential subject is commonly listed as a pseudo-probans, not belonging to a part of the inferential subject is not always explicitly listed in the same context but is often left understood although there are also some Sanskrit works in which not belonging to a part of the inferential subject is explicitly listed as a pseudo-probans. At any rate, whether not belonging to a part of the inferential subject is explicitly listed as a pseudo-probans or not, it is generally recognized and understood as a fault. The fourth kind of pseudo-adjunct is based on that. For an adjunct proper absence of the probandum in the inferential subject is inferred from

absence of the adjunct in the inferential subject. This inference is unsound if absence of the adjunct belongs to only a part of the inferential subject. When absence of a property chosen as an adjunct fails to belong to a part of the inferential subject, we have a pseudo-adjunct of the fourth kind.

In the example of Gangesa not being an atom is the pseudo-adjunct in the inference that the earth and so forth have a causal agent because of being products. According to the Nyāya ontology, there are both atomic and nonatomic substances that are included in the inferential subject, viz., the earth and so on. So the negation of not being an atom or being an atom is true of only a part of the inferential subject and not all of it. Since such negation is true of only a part of the inferential subject, it is incapable of proving that absence of the probandum belongs to the inferential subject as a whole.

Text. *Pūrva-sādhana-vyatirekah, yathā śarkarā-rasah anityah anitya-vṛtti-gunatvāt. Sa nityah rasanendriya-janya-nirvikalpaka-viṣayatvat rasatvavat ityādau. Pūrva-sādhanatāyāh prayoga-anurodhitvena avyavasthitatvāt kadācit nityatva-sādhana-vyatirekasya upādhitvam kadācit anityatva-sādhana-vyatirekatvasya iti vastu-vyavasthā na syāt upādheh nitya-doṣatvāt. Na hi yat yena sopādhisambaddham tat tena anupādhitvasambaddham sambhavati . Na tu satpratipakṣa-ucchedah pūrva-sādhana-vyatirekasya anupādhitve bījam, sthāpanāyāh yatra ābhāsatvam tatra pūrva-sādhana-vyatirekasya sādhya-avyāpakatvena anupādhitvāt. Na ca pūrva-hetoh tata eva asādhakatvāt satpratipakṣa-vaiyarthyam tatra iti vācyam. Agṛhyamāṇa-viśeṣa-daśāyām satpratipakṣa-sambhavāt*. (399–402)

Tran. (Fifth) absence of the previous mark (is a possible pseudo-adjunct)—for example, the taste of sugar is non-eternal because of being a quale that resides in a non-eternal entity. That is eternal because of being an object of indeterminate perception produced by the organ of taste like the universal tasteness. And so on. Since what is the previous mark depends on what is employed (first, for instance, depends on which particular inference takes place first), that is not fixed: (if the previous mark were an adjunct), sometimes absence of the mark for eternality would be an adjunct and sometimes the mark for non-eternality would be an adjunct and thus there would be no objective determination; however, an adjunct is a constant fault. Indeed, the following is not the case: that by virtue of which something (i.e., a mark) is subject to an adjunct (i.e., deviates from the probandum) is by virtue of the same thing devoid of the adjunct. It is not that the reason why absence of the previous mark is not an adjunct is that then counterbalancing is eliminated (as a pseudo-probans): in a case where the grounding (in generalization) is faulty (i.e., the mark deviates from the probandum), absence of the previous mark would not be pervasive of the probandum and hence would not be an adjunct (so that the status of counterbalancing as a pseudo-probans remains unaffected). It should not be said that since the previous mark fails to be a probans because of that (i.e., deviation) itself, counterbalancing is useless there,

for counterbalancing remains pertinent while the specific information (regarding deviation) is not known.

When an inference is counterbalanced by another inference, which of them is first in time is not logically relevant. It is also quite possible that the inference that happens to be first in time in one occasion could be second in another occasion. Either the same person or another person could reverse the temporal order of the two inferences at a different time. Hence absence or negation of the previous mark is not an adjunct proper that can fault an inference merely by virtue of being used as a mark in the previous inference.

The rejection of this kind of adjunct has no adverse implication for recognition of counterbalancing as a kind of pseudo-probans. It may very well be that the mark used in the previous inference deviates from the probandum. But that may not be known to the respondent who may resort to counterbalancing as a strategic move in a debate.

Gangesa's example in a way utilizes the ambiguity of what may be meant by the taste of sugar. If the latter is taken to mean the particular taste of a particular lump of sugar, that is a perishable quale and cannot outlast that lump of sugar. That is the point made by a debater in the first inference. But the taste could also mean the recurrent universal of tasteness that is, according to the Nyāya, common to all particular tastes and eternal. Such a universal may be grasped in indeterminate perception in the Nyāya view. The second inference from the respondent draws upon these positions. In such a case there is no real disagreement, for the two debaters are addressing different things. But the first debater may be a nominalist who rejects universals and disallows the possibility of taste being eternal. Then there is real disagreement. In counterbalancing the stalemate is resolved if one debater is able to bring additional reasons that tip the balance to one's side.

RS points out that absence or negation of the previous mark is not invariably an adjunct or invariably a pseudo-adjunct [*Pūrva-sādhana-vyatirekatvam tu na upādhitvena na api anupādhitvena niyatam, vahninā dhūmasya sthāpanāyām pratihetau ārdrendhana-abhāve vahni-abhāvasya upādhitāyāh dhūmābhāvasya ca ārdrendhana-abhāvena sthāpanāyām pratihetau vahnau ārdrendhanasya anupādhitāyāh ca prasañgāt*, RS in GD 1075]. Consider the inference of smoke (in a particular hot iron ball) from fire. Here the counterinference is that of lack of smoke (in that hot iron ball) from lack of wet fuel. If absence or negation of the previous mark were invariably an adjunct, the latter inference would have been faulted by absence of fire (fire being the mark in the previous inference) as an adjunct. In the counterinference lack of smoke is the probandum. If absence of fire were an adjunct proper, it should have pervaded lack of smoke, the probandum [*Vahnyabhāvasya . . . dhūmābhāva-*

rūpa-sādhya-avyāpakatayā anupādheh, GD 1076]. But that is not so, for there is lack of smoke in another hot iron ball that is not the inferential subject but no lack of fire. This counterexample shows that absence or negation of the previous mark is not always an adjunct.

Again, consider the inference of lack of smoke from lack of wet fuel. Here the counterinference is that of smoke from fire. In this counterinference wet fuel (that is also the absence of the previous mark) is an adjunct proper, for wet fuel does pervade the probandum, smoke, and does not pervade the mark, fire. Since in this case absence of the previous mark turns out to be an adjunct, it follows that absence of the previous mark is not always a pseudo-adjunct. RS adds that absence of the previous mark should not be offered as an adjunct unless that has the backing of a superior supportive CR and, accordingly, there is agreement among debaters that absence of the previous mark on its own is not an adjunct [*Balavattara-anukūla-tarkam vinā pūrva-saādhana-vyatirekah na upādhitvena udbhāvyah iti kathaka-samaya-vaśāt eva asau upādhitvena na upanyasyata iti*, RS in GD 1075].

Text. *Pūrva-sādhana-vyāpya-vyatirekah, yathā akartṛkatva-anumāne nityatva-ādih*. (402–3)

Tran. (Sixth) Absence or negation of what is pervaded by the previous mark—for example, eternality and so on in the inference of not having a producer.

Take the inference that earth, etc., have a producer (*sakartṛka*) because of being limited to a particular time (*kādācitka*)—that is, because of being something that arises only at a given time when all causal conditions are available and the causal aggregate is complete. These may be called occasional things. All occasional things are non-eternal and all non-eternal things in the sense of things with a beginning are occasional. Thus non-eternality is pervaded by occasionality that is the previous mark (with reference to the counterinference below). The negation of non-eternality is eternality (here the intended sense of eternality is being endless). Thus eternality is something that is the negation of what is pervaded by the previous mark [*Kṣityādikam sakartṛkam kādācitkatvāt iti atra anityatvam kādācitkatva-vyāpyam, tat-vyatirekah ca nityatvam iti*, GD 1077]. Eternality in the sense of being endless: *dhvamsapratiyogin* (that does not pervade being without a producer, the probandum) is a pseudo-adjunct in the counterinference that earth and so on are without a producer because of not being produced by something with a body [*Yathā akartṛkatva iti. Kādācitkatvena sakartṛkatva-sthāpanāyām ajanyatve pratihetau*, RS in GD 1075–76].

It may be noted that unless one interprets the above text carefully, it may appear to be anomalous as Phillips points out (139). But there is no anomaly

in Gangesa's text as RS, GD and so on have shown and as our explanation too shows.

Text. *Pakṣa-vipakṣa-anyatara-anyah, yathā prasiddha-anumāne parvata-jalahra-da-anyatara-anyatvam.* (403–4)

Tran. (Seventh) being different from (the pair of) either the inferential subject or the negative instances (disni)—for example, being different from (the pair of) either the hill or a lake with reference to the stock inference (of fire in the hill from smoke).

Being different from both the inferential subject and a negative instance (*vipakṣa*: a place where absence of the probandum is certain or reliably known) can be a pseudo-adjunct. A positive instance is a place where presence of the probandum is certain or reliably known. Hence a positive instance (*sapakṣa*) is different from both the inferential subject (where presence or absence of the probandum is dubious) and a negative instance and the property of being a positive instance can be a pseudo-adjunct. Like the already familiar bois being a positive instance too seems to pervade the probandum, for every place where the presence of the probandum is certain is a positive instance. Thus from the very nature of the case the property of being a positive instance is co-located with the probandum in all such cases. At the same time, since the inferential subject is not a positive instance, the property of being a positive instance is absent in the inferential subject where the mark is taken to be present and thus the said property does not pervade the mark. Nevertheless, not being the hill or a lake and so on is a pseudo-adjunct for the inference of fire in the hill from smoke. If it were an adjunct proper, absence of the probandum fire in the inferential subject hill could be inferred soundly from absence or negation in the inferential subject of the adjunct of not being the hill or a lake. For this to be possible absence of fire should pervade the absence or negation of not being the hill or a lake. That is, absence of fire should pervade being the hill or a lake. But this is not so, for the property of being the hill or a lake is present in the hill where absence of fire is uncertain (and is eventually negated when fire is inferred in the hill).

This case shows that Gangesa and others are at home in using complex terms built out of connectives within a general proposition. The pseudo-adjunct is a complex property built with the connective "or." One implied generalization is that the probandum is pervaded by disni. In the given example this translates into the general proposition that wherever there is fire with certainty there is difference from either the hill or a lake where the predicate is a complex term. The contraposed version of the latter needed for showing why the said property is a pseudo-adjunct is that wherever there is lack of the difference from

either the hill or a lake there is lack of fire. All this is clearly necessary for understanding this kind of pseudo-adjunct and in spite of the brevity of the text must be included in Gangesa's theory. The specimen also implicitly uses the formal law that a disjunction is true if either disjunct is true. That is, S is P or Q if S is P or if S is Q; similarly, S or P is Q if S is Q or if P is Q. Alternatively, if interpreted as a law of propositional logic, if P, then P or Q and if Q, then P or Q. There is also an implicit use of the so-called De Morgan law that not (P or Q) if not P and not Q. A positive instance is not either the inferential subject or a negative instance because it is different from both. This follows from the very concepts or definitions of a positive instance, the inferential subject and a negative instance. Without doubt advanced formal analysis underlies the recognition of this kind of pseudo-adjunct. Gangesa has first indicated this kind of pseudo-adjunct in general terms as disni. Then he has given an example that is a substitution instance of the general schema.

Although the said property can be a pseudo-adjunct, it can also be an adjunct proper in some cases. Take the inference that the iron ball is smoky because it is fiery. Here the property of not being either the iron ball or a lake is an adjunct that shows that the inference is faulty [*Pakṣa-vipakṣa-anyatara-anyatvam . . . kvacit upādhyābhāsa iti śeṣah, tena ayogolakam dhuūmavat vahneh ityādau ayogolaka-hrada-anyatara-anyatvasya sat-upādhitve api na kṣatih*, MN 405]. All places like kitchens using wet fuel where the presence of smoke is certain are also places that are different from the iron ball and a lake. Thus the probandum smoke is pervaded by the property of not being either the iron ball or a lake. However, the mark fire is taken to be present in the iron ball where the said property is absent. Thus the mark is not pervaded by that property. Since the said property is reliably known to pervade the probandum smoke, from absence of the said property in the iron ball, the inferential subject, absence of the probandum smoke may also be inferred in the inferential subject.

Text. *Pakṣetara-sādhya-bhāvah (by amending the printed text: pakṣetara-sādhya-abhāvah), yathā atra eva parvatetara-agnimattvam. Na ca atra vyartha-viśeṣaṇatvam dūṣanam, tattve api upādheh ābhāsatvāt.* (404–5)

Tran. (Eighth) presence of the probandum at a place other than the inferential subject—for example, in this very case (of inferring fire in the hill from smoke) having fire at a place other than the hill. It is not that having a superfluous qualifier is a fault here. Although that is the case (i.e., a superfluous qualification is a fault), the adjunct is pseudo (and the explanation offered earlier for a similar issue about bois is applicable here too).

MN interprets the text as being the locus of the probandum at a place other than the inferential subject (*pakṣetaratva-viśiṣṭa-sādhya-ādhāratvam iti*

arthah, MN 405). This agrees with our emendation. In Sanskrit Devanagari characters, the difference between *bhāva* and *abhāva* is less pronounced than it is in the English transliteration and a copier may have had made the mistake and passed it on to other copiers. Phillips (140) citing the authority of Tatacharya amends the text as *pakṣetara-sādhya-ādhāra*. This too agrees with the comment of MN.

Presence of the subject in a place other than the inferential subject is extensionally equivalent to the previous property of disni and like that can be a pseudo-adjunct for the same reason in some cases and can be an adjunct proper in some other cases. The stock inference of fire in the hill from smoke is a case where the property of having fire in a place other than the hill is a pseudo-adjunct. But in the inference of smoke in an iron ball from fire the property of having smoke in a place other than the iron ball is an adjunct proper.

Text. *Tattulyah ca, yathā atra eva parvatetara-indhanavatvam*. (405)

Tran. (Ninth) and something equivalent to that—for example, in this very case (the property of) having fuel at places other than the hill.

Other properties extensionally equivalent to the immediately previous property can also be pseudo-adjuncts for the same reason in some cases and can be an adjunct proper in some other cases. One such extensionally equivalent property is having fuel in a place other than the hill that is a pseudo-adjunct for the inference of fire in hill from smoke. On the other hand, having fuel in a place other than the iron ball is an adjunct proper in the inference of smoke in an iron ball from fire. The explicit mention of equivalence is an indication of the crucial role of formal analysis in such cases of pseudo-adjuncts.

Text. *Evam vahni-sāmagryādikam ūhyam*. (405)

Tran. (Tenth) in the same way the sum-total of the causal conditions of fire and so on should be analyzed.

The sum total of causal conditions of fire is a pseudo-adjunct in the inference of fire in the hill from smoke for the same reason as the immediately previous property. On the other hand, the sum total of causal conditions of smoke is an adjunct proper in the inference of smoke in an iron ball from fire. The words "in the same way" indicate that the same logic applies here as in the immediately previous case and highlights by implication the important role of formal analysis in such cases of pseudo-adjuncts.

9

Sriharsa's *Khaṇḍanakhaṇḍakhādyam* on Pervasion

Text. [*Y*]*atra tu na kadāpi vyabhicāradarśanam tatra vyāptih iti cet? Na, anyatrāpi vyabhicāro na drakṣyate ityatra niyāmakādarśanāt*. (355)

Tran. Objection: What if there is pervasion where there is never any awareness of deviation? Reply: No, for there is no warranty that deviation will not be found somewhere else in the future.

Take the pervasion of one natural class such as smoke by another natural class such as fire. Suppose that there is no observed case of deviation (i.e., in no observed case, for example, smoke is found without fire). It is understood that the pervasion under consideration is confirmed in each observed case (i.e., in each observed case, for example, smoke is found with fire). Is the pervasion reliable then? No, says Sriharsa. There are always unobserved future cases where deviation is possible and there is no reliable evidence to rule out such possibility. [Gangesa agrees with Sriharsa on this point.]

Text. *Nāpi vipakṣe bādhakastarko vācyah, tarkasya vyāptimūlatvābhyupagame anavasthānaprasañgāt. Tadanabhyupagame mūlaśaithilyena tarkābhāsatvāpātāt*. (355)

Tran. Nor should it be said that CR is an obstruction to the rival position (*vipakṣa*). If it is held that CR is based on pervasion, the consequence is an infinite regress. If that is not held, we have as a consequence a pseudo CR due to an unstable base.

One could argue that the possibility of deviation is ruled out by subjunctive reasoning. Sriharsa rejects this on the following ground. Either the CR is

based on a pervasion or not. If it is based on a pervasion, another CR is needed to forestall the possibility of deviation in the latter pervasion. This would open the door of an infinite regress (*anavasthā*) or if the regress is stopped at some point, there would be circularity (*anyonyāśraya*). The need for the base provided by pervasion is due to that in a CR there is an antecedent (*āpādaka*) and a consequent (*āpādya*); unless the antecedent is pervaded by the consequent, the intended outcome would not follow logically. For example, the pervasion of smoke by fire is supported by the CR that if smoke deviated from fire, smoke would not be an effect of fire. [In continuation of the CR it is argued further that if one actually supposes that smoke is not always an effect of fire, one would not always unwaveringly get fire to make smoke.] That smoke is a deviant from fire is the antecedent and that smoke is not an effect of fire is the consequent. It is presupposed here that if something deviates from something it is not an effect of that thing or in other words that whatever deviates from something is not an effect of that thing. This too is clearly a pervasion that could also be called into question by a skeptic. The same would be the fate of any other pervasion providing the base of any other CR. This shows the inevitability of infinite regress or circularity, for a pervasion between the antecedent and the consequent of the CR is necessary to make the latter sound. Hume argued that all induction is circular, because it is at least necessarily assumed that the future will resemble the past that is itself an induction. Sriharsa is making a similar point.

One may try to avoid the infinite regress (or circularity) by denying that CR is based on pervasion. But then, argues Sriharsa, the conclusion would not logically follow from the premises and the CR would be unsound.

[Gangesa disagrees with Sriharsa here. The task of CR is not to rule out the possibility of deviation but to confer reliability on a pervasion that is confirmed by supportive instances and is not known to have any counterexample. Gangesa is a fallibilist and grants the possibility that a reliable induction may be false. So reliability does not mean impossibility of any future deviation. A distinction must be drawn between a possible fear of deviation and an actual, occurrent fear of deviation. The goal of CR is not to obstruct possible fear of deviation. That is an unreasonable goal, for an induction does not rise above the suspicion of deviation and a demand for such unreasonable warranty is based on (in the light of modern terminology) confusion between factual truth and logical truth. Rather, the goal is to obstruct the supposition that there is an actual occurrent fear of deviation in each and every case of induction. Again, it is an obstruction not in the sense that it renders such a supposition impossible. Indeed, for a fallibilist like Gangesa that too is an unreasonable task. Rather it is an obstruction in the sense that it offers counterevidence to the reliability of such a supposition. Gangesa seeks to escape the dilemma

of Sriharsa by grabbing the first horn of it. Even if CR is based on pervasion, an infinite regress is not inevitable to allay actual fear of deviation in each case. Although fear of deviation is possible in each case, it is also possible that there is no actual fear of deviation in some cases. If the latter is the case and there is no actual fear of deviation in some cases, a further regress of CR to allay such fear would be unnecessary. So the claim of infinite regress goes beyond what is warranted by the evidence and is based on confusion between logical truth and factual truth. That is, the claim of infinite regress in the justificatory process is tenable only if there is not only possible fear of deviation but also actual fear of deviation in each and every case. The evidence falls short of showing that there is actual fear of deviation in each and every case. So the claim of an infinite regress is not tenable. This position of Gangesa is consistent with his overall epistemological position that reliability or truth is extrinsic (*paratah*). From this viewpoint awareness need not be known to be reliable in order to be reliable. The skeptical charge of infinite regress in justification of induction (as well as infinite regress in justification of knowledge in other cases) is based on the assumption that awareness cannot be reliable unless it is known to be reliable—an assumption that Gangesa rejects.

Additionally, when one unwaveringly acts on an induction (such as when one eats to get nourishment, implying that food is necessary for nourishment, or one uses speech to communicate with another person, implying that speech is necessary for communication), such action is counterevidence to the presence of actual fear of deviation in such cases, as already discussed. The fear of deviation is in need of a causal explanation like any other event. Although Sriharsa and Hume both question the universality of causal explanation, neither rejects the need for a causal explanation for anything that comes into being. All that the fear of deviation shows for Sriharsa or Hume is that the thing could also be produced by something other than the accepted cause and not that the thing has no cause at all. Unwavering action provides counterevidence to the availability of any causal explanation and gives rise to the presumption that none will be available. The skeptic could object that presumption falls short of logical guarantee. For Gangesa, however, such objection would be welcome (*iṣṭāpatti*). To a fallibilist like Gangesa, as already said, logical guarantee is out of place for justification of an empirical truth like all smoky things are fiery.]

Text. *Atha brūṣe na śakyamidam vaktum. Tathāhi dhūmāgnivyabhicāraśamkāyām bādhakastarkah ayamabhidhīyate yadi dhūmah agnim vyabhicaret akāraṇah sannityah syāt na syādeva vā. Sa cayamanuttarastarkastatra śmkāyām vyāghātāpatteh. Tadeva hyāśamkate yasminnāśamkyamāne svakriyāvyāghātādayo doṣa nāvatarantīti lokamaryādā. Evam sarvatranatturastarko bādhakamabhidheya iti.*

Maivam. Kimityevam śamkitavyam yaddhetuphalabhāva eva na bhaviṣyatīti. Evam tu śamkitavyam, agnim vihāya anyasmādapi hetorayamudesṣyatīti. (357)

Tran. You may say that this cannot be asserted. Thus with regard to the fear of deviation of smoke from fire the following may be stated as the obstructing subjunctive reasoning. If there were smoke without fire, smoke would be uncaused and eternal or would be nonexistent. Such unanswerable subjunctive reasoning is the alleged opposition (*vyāghāta*) to fear (of deviation) there. One may entertain fear (of deviation) only so long as there is no such fault as conflict (*vyāghāta*) with one's own action—this is commonly honored. Such unanswerable obstructing subjunctive reasoning should be stated in every case. But this is not so. Should this alone be feared that the very cause-effect relation would not be there? Rather, the fear should be thus: this would arise from something other than fire.

Sriharsa refers to Udayana's comments on NK III.7 and sets up the CR as follows: if smoke were deviant from fire, smoke would have been uncaused and eternal or would have been nonexistent. This set-up leaves out the alternative that smoke could be produced by something other than fire. Sriharsa adds this alternative by way of reply to show that the CR is ineffective.

[Of course, the CR could be set up including the last alternative as Gangesa has done, as we have seen. The argument from belief-behavior conflict would still go through. That is, if someone actually fears that smoke could be produced by something other than fire, one would not always unwaveringly make fire to produce smoke. Such unflinching uniform behavior is the counterevidence (*bādhaka*) to the presence of any actual fear.]

Text. *Na ca vāyam evam hi sati dhūmasya ekajātimatvam na syāditi. Kvacit indriyajatve kvacit anumānadijatve vijñānaikajātyavattādupapatteh.* (357)

Tran. It should not be said that smoke could not be of the same kind if such were the case. That can be explained in the way cognition is of the same kind in spite of being produced by sense organs sometimes and inference and so on at some other times.

If smoke is produced sometimes by fire and sometimes by something else, how can all smoke be of the same kind? The point of this objection is that things produced by different kinds of causes are of different kinds. Accordingly, if the effect is of the same kind, we should not postulate different kinds of causes. This challenges the skeptical suggestion above that smoke could be produced by something other than fire in future.

Sriharsa responds to the objection by pointing to something that is accepted by the Nyāya. In the latter view cognition is produced by a variety of causal conditions. In perception the sense organ is a causal condition. In probans-

based inference awareness of pervasion (or awareness of something pervaded belonging to the inferential subject) is a causal condition. And so on. If cognition could be of the same kind in spite of being produced by so many different kinds of causal conditions, smoke too could be of the same kind in spite of being produced by different kinds of causal conditions.

[The Nyāya does offer a solution to this issue. In the Nyāya view the contact between the self and the inner sense is the common (*anugata*) causal condition of all cognitive states. This helps to explain how they are of the same kind. Sriharsa takes note of this and criticizes it a little lower down.]

Text. *Tatra indriyādīnām avāntarasāmānye sākṣātkaritvādau prayojakatvam na jñānatāyāmiti cet? Na, jñānatvasya āksmikatvaparihārāya tatkāraṇasya anugatasya bhavatā avaśysam vaktavyatvāt.* (357)

Tran. Objection: The sense organs and so on are causal conditions of subordinate species like perception and so on and not of cognition as such. Reply: No. In order to avoid that cognition could arise by chance you must state the common causal condition of that.

The Nyāya holds that the sense organ is a specific causal condition of perception, awareness of pervasion is a specific causal condition of probans-based inference and so on. This does not obviate the need for a common causal condition for all cognition as Sriharsa says (and the Nyāya agrees with that).

Text. *Dhūme api vahnerviśeṣe eva prayojakatvasya tadvacchamkitum śakyatvāt. Na Dṛśyate tāvadagniprayojye dhūme viśeṣa iti ca na vācyam. Tadarśanasya āpātato hetvantaraprayojyāvāntarajātyadarśanenayogyatayā vikalpyatvādapi upapatteh. Yadā tu hetvantaraprayojyo dhūmasya viśeṣo drakṣyate tadā asau vikalpayiṣyate iti sambhāvanāyāh durnivāratvāt.* (357)

Tran. It is possible to suppose that like that fire too is a specific causal condition of smoke. It should not be said that no specific feature is found in smoke produced by fire. The nonperception of that may be for the time being explained as follows: since other features caused by other causal conditions are not yet noticed, (the specific feature) is not for the time being perceptible. The possibility cannot be ruled out that when specific features of smoke caused by other causal conditions are noticed in future, this (specific feature of smoke produced by fire) will be seen.

Sriharsa suggests that smoke could also be produced by things other than fire and that smoke produced by fire could have some special feature just as smoke produced by something else could also have some special feature. One could object that no special feature in smoke produced by fire is ever perceived. Sriharsa replies that such nonperception may be due to our fail-

ing to notice other special features in smokes produced by other causal conditions.

[If smoke produced by fire is a specific kind of smoke with a special feature as distinguished from another specific kind of smoke produced by something other than fire with some other special feature, the uniformity of causal connection is not necessarily violated. So this possibility would not necessarily spell any trouble for the Nyāya. The latter does not, however, recognize kinds of smoke produced by things other than fire, for the evidence for that is lacking. It is possible that we may begin to notice different kinds of smoke with different specific features in the future. As long as the different specific features are uniformly linked with different causal conditions and the empirical evidence for that is reliable, the Nyāya would not be opposed to that.]

> Text. *Asti ātmamanoyogah anugatam kāraṇam jñānotpattau iti cet? Na. Yadi ātmamanoyagāt utpadyamānam jñānam syāt icchādayah api jñānam prasajyeran*. (359)

> Tran. Objection: The contact between the self and the inner sense is the common causal condition of cognition. Reply: Not (enough). If something arising from the contact between the self and the inner sense were cognition, desire, etc., too would have been cognition.

Sriharsa now takes note of the standard Nyāya solution to the issue of finding a common causal condition for all cognitive states. He points to an apparent difficulty in that solution. The contact between the self and the inner sense is also a causal condition of desire and so forth in the Nyāya view. The difference between cognition and desire, etc., is then wiped out.

[The Nyāya offers a solution to the issue here as well. The difference between different kinds of effects sharing the same causal condition is not wiped out because the sum total of causal conditions remains different. A distinction should be drawn between a necessary (*niyata*) causal condition and the sum total (*samagri*) of causal conditions. Although different kinds of effects may share the same necessary condition, other causal conditions included in the sum total suffice to preserve the difference.]

The relevant point here is that a skeptic like Sriharsa or Hume may indeed suppose that an effect like smoke may be produced by something other than the known cause like fire. Such a supposition is logically possible. But is there any good reason to accept such a supposition as plausible or probable? A skeptic may try to offer evidence for exceptions to known cases of causal connection. For example, it may be pointed out that though nearly all earthen substances are breakable by iron, diamond is an earthen substance that is not so. To a Nyāya philosopher such alleged exceptions can always be explained

within the framework of uniform causal connection upon closer examination. For example, the seeming anomaly in the cited case may be resolved by considering that some other factor such as possibly high density allows diamond to offer greater resistance to iron.

Another problem is provided by alleged cases of plurality of causes. For example, fire can be made from wood, grass, electricity and so on. To a Nyāya philosopher such cases too provide no real exception to uniform causal connection. They can either be shown to share a common causal condition (such as in the case of fire that different sources may still share a common motion in atoms or molecules) or the effects may be found to be significantly different (such as that wood fire produces smoke while electric fire does not) so that different species of the effect may be linked to different kinds of causes.

Thus from the Nyāya viewpoint the skeptical supposition that an effect may in the future be produced by something other than the accepted cause has nothing to recommend for it except logical possibility. A factual supposition that is merely logically possible and has no empirical support is neither plausible nor probable and, therefore, not acceptable. So far as we can see Sriharsa has not succeeded in refuting the case for uniform and reliable causal connection made by Udayana and so on (although it should be added for the sake of fairness that Sriharsa does have much more to say that we have skipped due to the limitation of space).

Sriharsa suggests that in order to cast doubt on induction it is not necessary to challenge causal connection as such; rather, it suffices to suppose that the same effect could be produced by some other cause. The objection to that is that how can we then account for the fact that effects are of the same kind. Can being of the same kind be merely left to chance (*ākasmikatā*)? If so, is there any need for causal connection? If things could happen to be of the same kind by chance, why could not they also happen by chance?

We now skip down to one last passage of Sriharsa.

Text. *Vyāghāto yadi śamkāsti. Na cet śamkā tatastarām. Vyāghātavadhirāśamkā. Tarkah śamkāvadhih kutah*? (364)

Tran. If there is conflict, there is doubt. If not, there is doubt all the more. There is doubt as far as the boundary of conflict. How can subjunctive reasoning be the limit of doubt?

The reason why conflict involves doubt is that conflict involves opposition that in its turn involves pervasion that in its turn can be open to doubt. For example, the conflict between night and day involves the pervasion that whenever it is night, it is not day, and vice versa. Since CR brought in support of pervasion relies on conflict that cannot but involve pervasion for the argu-

ment to be sound, circularity or infinite regress is inevitable, alleges Sriharsa in a way similar to Hume's critique of induction, as already noted.

[Gangesa's rebuttal of this has also been noted before. The point of CR is not to rule out the possibility of doubt. An empirical induction is always open to merely possible doubt in the view of Gangesa. Rather, the point is to offer counterevidence to the supposition that an actual doubt attends each and every induction. The counterevidence comes from unwavering action that shows belief in an induction. While actual doubt would chip away from reliability of an empirical induction, merely possible doubt would not.]

10

Selected Passages from Prabhacandra's *Prameyakamalamārtaṇda* on Critique of Pervasion and Inference

Text. *Ye hi pratyakṣam ekam eva pramāṇam iti ācakṣate na teṣām anumānādi-pramāṇāntarasya atra antarbhāvah sambhavati. . . . Nanu ca asyah aprāmāṇyāt na antarbhāva-vibhāvanāyā kimcit prayojanam. Pratyakṣam ekam eva hi pramāṇam, agauṇtvāt pramāṇasya. Artha-niścāyakam ca jñānam pramāṇam, na ca anumānāt artha-niścayao ghatate sāmānye siddha-sādhanāt viśeṣe anugama-abhāvāt.* (177)

Tran. He who says that perception is for sure the only one source of knowledge cannot provide for the inclusion here of other sources of knowledge like inference and so on. Objection: Since this (inference) is not a source of knowledge, what is the use of thinking about its inclusion? Perception for sure is the only one source of knowledge, for a source of knowledge does not have a subordinate (*agauna*) status. Further, knowledge is a state of awareness of an object with certainty. No certainty about an object comes from inference: if something in general (is inferred), there is (the fault of) proving what is already known; if something in particular (is inferred), there is (the fault of) lack of uniform connection.

Prabhacandra (fourteenth century) is a leading Jain logician and philosopher. His *Prameyakamalamārtaṇda* is a voluminous work that includes a detailed, careful and innovative study of a large number of mainly epistemological and metaphysical topics and a sustained critique of the viewpoints of other philosophical schools like the Nyāya, the Vaiśeṣika, the Mīmāmsā, the Vedānta, the Sāmkhya, the Śābdika, the Carvaka, the Bauddha and so on. Here he takes on the Carvaka view that perception is the only source of knowing. One Carvaka reason for this position is that other sources like inference are ultimately and indispensably dependent on perception. For example, universal premises needed for inference are in the end founded on

observation of particulars and our awareness of the mark or of the inferential subject needs eventually to be perceptual in order to avoid an infinite regress. Accordingly, other sources play a role that is subordinate to perception and hence do not qualify as sources of knowing that should not be subordinate to anything to produce knowledge. Another reason is that so far as inference is concerned either there is no novelty or there is no certainty. For example, in inferring fire from smoke there is no novelty if all that is inferred is merely that fire exists, for the existence of fire is already accepted. On the other hand, there is no certainty if it is inferred from smoke in a particular place that there is fire in that place, for that smoke is pervaded by fire is open to skeptical doubt.

Text. *Kimca vyāpti-grahaṇe pakṣadharmatā-avagame ca sati anumānam pravarttate. Na ca vyāpti-grahaṇam adhyakṣatah, asya sannihita-mātra-artha-grāhitvena akhila-padārtha-ākṣepeṇa vyāpti-grahaṇe asāmarthyāt. Nāpi anumānatah, asya vyāpti-grahaṇa-purassaratvāt. Tatrāpi anumānatah vyāpti-grahaṇe anavasthā-itaretarāśraya-doṣa-prasañgah. Na ca anyat pramāṇam tat-grāhakam asti. Tat kutah anumānasya prāmāṇyam?* (177–78)

Tran. Moreover, there is inference only if there is knowledge of pervasion and that (the mark) belongs to the inferential subject. But knowledge of pervasion does not come from perception, for by the latter is grasped only that with which there is sensory connection and hence the latter is incapable of grasping pervasion that encompasses everything (of a kind). (Knowledge of pervasion) cannot also come from inference, for the latter is preceded by knowledge of pervasion. If inference is needed there too, there is as a consequence the fault of either infinite regress or circularity. There is also no other source that can give rise to knowledge of that (pervasion). How can then inference be a source of knowing?

Carvaka spells out the familiar argument that neither perception nor inference nor any other source can provide the foundation for knowledge of pervasion that is needed for a paradigmatic kind of inference.

Text. *Iti asamīkṣita-abhidhānam, anumānaderapi adhyakṣavat pratiniyata-svaviṣaya-vyavasthāyām avisamvādakatvena prāmāṇya-prasiddheh. Pratyakṣe api prāmāṇyam avisamvādakatvāt eva prasiddham; tat ca anytra api samānam anumānadinā api adhyavasite arthe visamvāda-abhāvāt.* (178)

Tran. Reply: The (above) states something that has not been thoroughly examined. Like perception inference and so on too have their own respective objects that are restricted to each and the reliability of these sources is founded on coherence. In the case of perception too reliability is founded on coherence. This applies equally elsewhere: there is no discordance in things grasped by inference and so on as well.

Not all perception is reliable. How do we know that a given perception is reliable or unreliable? We know this, Prabhacandra claims, from agreement or disagreement with other judgments. This applies to inference and other sources too. Further, perception inference and so forth also each have an object that can be grasped only by that source and no other source. Specifically, particulars can be directly grasped only by perception and universals that can provide the objective basis for inclusion of particulars in a class and exclusion of others from that class can be grasped only by inference.

Text. *Yat ca agauṇatvāt pramāṇasya iti uktam, tatra anumānasya kuto (gauṇatvam), gauṇārtha-viṣayatvāt pratyakṣa-pūrvakatvāt vā? Na tāvat ādyah vikalpah; anumānasya api adhyakṣavat vāstava-sāmānyaviśeṣa-ātmaka-artha-viṣayatva-abhyupagamāt. Na khalu kalpita-sāmānya-artha-viṣayam anumānam saugatavat jainaih iṣṭam, tat-viṣayatvasya anumāne nirākariṣyamānatvāt. Pratyakṣa-pūrvakatvāt ca anumānasya gauṇatve pratyakṣasya api kasyacidanumāna-pūrvakatvāt gauṇatva-prasañgah, anumānāt sādhya-artham niścitya pravarttamanasya adhyakṣa-pravṛtti-pratiteh. Ūha-akhya-pramāṇa-pūrvakatvat ca asya adhyakṣa-pūrvakatvam asiddam.* (178)

Tran. It has been said that a source of knowledge is not subordinate or secondary to (anything else in generating knowledge). In this respect, what is subordinate or secondary about inference? Is it due to that the object (of inference) is secondary or is it due to that (inference) is based on perception? The first alternative does not hold. As in the case of perception, in the case of inference too it is admitted (by us the Jains) that inference has its object, viz., the objective universal that serves as the basis of both class inclusion and class exclusion. Indeed, the Jains do not hold, like the Buddhists, that the hypostatized universal is the object of inference, for that such is the object of inference will be refuted. Now suppose that inference is subordinate or secondary because of being based on perception. But then, since in some cases perception too is based on inference, perception too should be secondary: it is known that (sometimes) after one has ascertained through inference that there is the probandum one may perceive it (without having perceived it before). Further, since (inference) is based on the source of knowing called *ūha*, it is not accepted that (inference) is based on perception.

Prabhacandra argues that objective universals should be admitted and that the Buddhist position that universals are mere constructions is not sound. But then inference has its own proper object (for such universals are not grasped by perception), and hence inference cannot be labeled as a secondary or subordinate source of knowing. Second, he argues that sometimes things that may have been overlooked or unnoticed before may get to be perceived after one has learnt about them by way of inference. Accordingly, just as inference is dependent on perception so also is perception dependent on inference. If

inference is held to be secondary because of being dependent, perception too should be held to be secondary. (Then nothing would qualify as a source of knowing: such an extreme form of skepticism is self-refuting, Prabhacandra implies.) Third, Prabhacandra argues that perception cannot provide the basis for inference, for the general premise stating the pervasion of the mark by the probandum needed for inference cannot come from perception. Rather, a different source of knowing (to be explained later) is the proper basis.

> Text. *Yat ca uktam na ca vyāpti-grahaṇam adhyakṣatah iti-ādih tadāpi uktimatram, vyāpteh pratyakṣa-anupalambha-bala-udbhūta-ūha-ākhya-pramāṇāt prasiddheh. Na ca vyaktinam ānantyam deśādi-vyabhicārah vā tat-prasiddheh bādhdakah; sāmānya-dvāreṇa pratibandha-avadhāraṇāt tasya ca anugata-abādhita-pratyaya-viṣayatvāt astitvam. Prasādhayiṣyate ca sāmānyaviśeṣātmā tadarthah ityatra vastubhūta-sāmānya-sadbhāvah.* (178)

> Tran. It has been said that pervasion cannot be grasped by perception. This too is a mere (ineffective though true) statement. Pervasion is based on a source of knowing called *ūha* that rests on the strength on perception (apprehension) and nonapprehension. Neither the infinity of individuals nor deviation in place and so on suffice to obstruct the acceptance of that (pervasion). Pervasion is ascertained with the help of the universal; the existence of that (the universal) is based on its being the object of reliable awareness of uniformity that has not been shown to be false. In the (discussion) of (the aphorism) that the universal that is the basis of class inclusion and class exclusion is the object of that (inference) the existence of objective universals will be proven.

Universals should be admitted to exist, Prabhacandra argues, for they are objects of reliable awareness of uniformity (such as "this is a cow," "that is a cow" and so on) that is not shown to be false. Once universals are admitted, they become useful in accounting for knowledge of pervasion. The problem arises due to the fact that pervasion is about an infinite number of individuals that moreover include those that are in distant place or time. If, however, universals are objective, pervasion can be founded on them, for they constitute the common nature of each individual of a kind, however numerous or however distant in place or time they might be.

> Text. *Na ca ūha-pramāṇam antareṇa pratyakṣam eva pramāṇam agauṇatvāt ityādi-abhidhātum śakyam. Tathāhi agauṇatvam avisamvāditvam vā liñgam na aprasiddha-pratibandham sat pratyakṣasya prāmāṇyam anumāpayet atiprasañgāt. Pratibandha-prasiddhih ca anavayavena abhyupagantavyā, anyathā yasyām eva pratyakṣa-vyaktau prāmāṇyena agauṇatvādeh asau siddhah tasyām eva agauṇatvādeh tat sidhyet, na vyaktyantare tatra tasya asiddhatvāt. Na ca asau sākalyena adhyakṣāt siddhyet tasya sannihitamātra-viṣayakatvāt. Atha ekatra vyaktau pratyakṣeṇa anayoh sambandham pratipādya anyatra api evamvidham*

pratyakṣam pramāṇam iti agauṇatvadi-prāmāṇyayoh sarvopasamhāreṇa pratibandha-prasiddhih iti abhīdhiyate; na aviṣaye sarvopasamhāreṇa pratipatteh ayogāt. Sarvopasamhāreṇa pratipattih ca nāmāntareṇa ūha eva uktah syāt. Agnidhūmādīnām ca evam avinābhāva-pratipattih kim na syāt? Yena anumānam apramāṇam avinābhāvasya akhila-padārtha-ākṣepeṇa pratipattum aśakyāt iti uktam śobheta. (179)

Tran. Further, without the source of knowing (called) *ūha*, it cannot be asserted that "perception alone is the source of knowing because of not being subordinate or secondary." Thus the mark of not being subordinate or not being discordant cannot lead to the inference that perception is a source of knowing unless its pervasion (with the probandum) is known: otherwise there is overextension (i.e., unsound inferences are admitted as sound). However, pervasion needs to be known for the class as a whole. Otherwise, only that particular perception where this (pervasion) between not being subordinate and being a source of knowledge is known, is proved to be that (a source of knowing) with the help of not being subordinate, and so forth. But another particular (perception) is not proved (to be a source of knowing), for that (the relation of pervasion) is not known there. This (pervasion) cannot be known for the whole class through perception, for that has as an object only that with which there is sensory connection. It may be said that the relation (of pervasion) can be known in a given particular through perception; after that, it may be gathered that another perception of such nature also is a source of knowing; in this way the relation of pervasion as a whole between not being subordinate and being a source of knowing is known. But this is not acceptable; knowledge of the whole class that is not an object cannot take place, for there is no (sensory) connection. It is knowledge of the whole class that is labeled otherwise as *ūha*. Why should not pervasion between smoke and fire be known in this way so that the saying that "since pervasion subsuming everything cannot be known, inference is not a source of knowing" could be appropriate?

Unless a source of knowing for pervasion is admitted, the Carvaka could not prove his own case that perception alone is the source of knowing because of not being secondary. For this proof to be sound it is needed as a premise that nothing secondary is a source of knowing. This general premise cannot be known through perception or inference (or any other known source). So a new source called *ūha* should be admitted to explain such knowledge. But then other inferences, such as that of fire from smoke, should also be accepted.

Text. *Kim ca anumānamātrasya aprāmāṇyam pratipādayitum abhipretam, atīndriya-artha-anumānasya vā? Prathama-pakṣe pratīti-siddha-sakala-vyavahāra-ucchedah. Pratiyante he kutaścit avinābhāvinah arthāt arthāntaram pratiniyatam pratīyanto laukikāh, na tu sarvasmāt sarvam. Dvitīya-pakṣe tu katham atīndriya-pratyakṣa-itara-pramāṇanam agauṇatvādinā prāmāṇya-itara-vyavasthā? Katham vā paracetasah atīndriyasya vyāpāra-vyāhāradika-artha-*

viśeşat pratipattih? Svarga-apūrva-devatādeh tathāvidhasya pratişedhah anupalabdheh syāt? Sah ayam cārvākah "pramāṇasya agauṇatvāt anumānat artha-niścayah durlabhah" iti āckşanah katham atah eva adhyakşādeh prāmāṇyādikam prasādhayet? Prasādhayan vā katham atīndriya-itara-artha-vişayam anumānam na pramāṇayet? (179–80)

Tran. Again, is it the intention to prove that no inference is a source of knowing or that inference of the imperceptible is not a source of knowing? In the first view, all kinds of well-known activities are not accounted for. It is well known that people direct the effort to specific things from (knowledge of) specific things that are invariably related and not to everything from everything. In the second view, how can it be settled with the help of not being secondary and so forth (the marks that are not perceptible needed for inferring reliability that too is not perceptible) that sources other than perception that are about the imperceptible are not sources of knowing? How can also there be knowledge of other minds that are imperceptible from actions, utterances and other specific things? Should the heaven, karma, God and so on be rejected for lack of evidence? Carvaka says "since a source of knowing is not secondary, it is hard to find inference leading to ascertainment of anything." How can he who says this prove that perception and so forth are sources of knowing? (That is, how can Carvaka prove that perception is a source of knowing and inference and so forth are not sources of knowing?) But if he manages to prove (by using inference that perception is a source of knowing) how could he not (also) prove that inferences of the imperceptible and its other (the perceptible) are sources of knowing?

Suppose that no inference is reliable. Then how do we explain the fact that we do rely on inference for common activities, such as finding fire from smoke? To avoid this difficulty a Carvaka (as does Purandara) could suppose that only inference of the imperceptible is unreliable. But then the question is: how do we know that a cognitive state is reliable or unreliable? Reliability or unreliability is imperceptible and must be inferred. If the inference of the imperceptible is unreliable, knowing that a cognitive state is reliable or unreliable cannot be reliable. Nor can it be explained how knowledge of other minds is possible. It also goes without saying that heaven and so on (as well as imperceptible forms of matter) can no longer be admitted. Finally, either the Carvaka fails to prove (for which is needed inference that for Carvaka is unreliable) that perception is reliable or he uses inference to prove that perception is reliable and then he cannot deny that inference is reliable.

Text. *Upalambha-anupalambha-nimittam vyāpti-jñānam ūhah*. (3.11)

Tran. *Ūha* is awareness of pervasion based on apprehension and nonapprehension.

Text. *Upalambha-anupalambhau sādhya-sāhanayoh yathākşaya-upaśamam sakṛt punah punah vā dṛdataram niścaya-aniścayau na bhūyodarśana-adarśane. Tena*

atīndriya-sādhya-sādhanayoh āgama-anumāna-niścaya-aniścaya-hetuka-sambandha-vodhasya api samgrahāt na avyāptih. . . . Vyāptih sādhya-sādhanayoh avinābhāvah tasy jñānam ūhah. (348)

Tran. Apprehension or non-apprehension is, from the destruction/subsidence (of the karmic cover), one time or repeated firm ascertainment or lack of ascertainment of the probans and the probandum and not multiple observation or nonobservation. This includes awareness of the relation (of pervasion) between the probans and the probandum due to ascertainment or lack of ascertainment based on authority or inference; hence (the account) is not too narrow. Pervasion is invariable concomitance of the probandum with the probans; awareness of that is *ūha*.

Further discussion of *ūha* is introduced here. In the Jain view subsidence/destruction of the veil of karma is a necessary condition of knowing, including *ūha*. *Ūha* is awareness of pervasion between the probans and the probandum. It is based on a single or multiple, verifiable and reliable confirmation or disconfirmation of the relation that the probans does not exist without the probandum. Since attempted disconfirmation is a part of the process, a general claim must stand up to the challenge of exploring if the pervasion is false. The evidence for such confirmation or disconfirmation may come from perception as well as inference or authority. This opens up the possibility of support for the claim of pervasion in the light of the wider body of scientific or philosophical or religious or cultural discourse.

Text. *Tat ca vyāpti-jñānam tathā-upapatti-anyathā-anupapattibhyām pravarttate iti upadarśayati idam asmin ityādi.* (348)

Tran. That awareness of pervasion proceeds from explicability thus and inexplicability otherwise. This is shown in (the aphorism) "this if this" and so on.

Text. *Idam asmin sati eva bhavati asati tu na bhavati eva iti.* (3.12)

Tran. This is for sure only if this is and is not for sure if (the latter) is not.

Text. *Idam sādhanatvena abhipretam vastu, asmin sādhyatvena abhiprete vastuni sati eva sambhavati iti tathā-upapattih. Anyathā sādhyam antareṇa na bhavati eva iti anyathā-anupapattih. Vā-śabdah ubhaya-prakāra-sūcakah. Tau-eva-ubhaya-prakārau suprasiddha-vyakti-niṣṭhatayā sukha-avabodhārtham pradarśayati.* (349)

Yathā agnau eva dhūmah tadabhāve na bhavati eva iti ca. (3.13)

Tran. This, the thing intended as the probans, is possible only if there is this, the thing intended as the probandum: such is explicability thus. Otherwise (the probans) is not for sure possible without the probandum: such is inexplicability

otherwise. The word or (*vā*) indicates the two approaches (i.e., either method is appropriate). Both approaches are illustrated in the well-known particular case for easy comprehension.

For example, there is smoke for sure only if there is fire and for sure is not in the absence of that (fire).

For pervasion to hold it should be demonstrated that the probans cannot exist (or be explained) without the probandum and that the probans can exist (or be explained) only with the probandum. For example, there is smoke only if there is fire and smoke is not if fire is not. Another example is: there is displacement from one place to another place (*deśāntaraprāptih*) only if there is motion (*gātimattvam*) and not otherwise.

Text. *Tarkasya samvāda-sandehe hi katham nihsandeha-anumāna-uthānam? Tadabhāve ca katham sāmstyena pratyakṣasya aprāmāṇya-vyavacchedena prāmāṇya-siddhih? Tatah nihsandeham anumānam icchatā sādhya-sādhana-sambandha-grāhi pramāṇam asandigdham eva abhyupagantavyam*. (352)

Tran. If the agreement (reliability) of *tarka* is in doubt, how can there be inference that is free from doubt? In the absence of that how can it be proven that perception as a whole is reliable and separate it from what is not reliable? Therefore, one who wants inference to be doubt-free should admit a doubt-free source of knowing for the relation between the probans and the probandum.

The word *tarka* familiar in the Nyāya and other schools is used here for *ūha*. We also have the already familiar argument that the Carvaka cannot prove that only perception is a source of knowing without the help of inference that then should be reliable and that for inference to be reliable we should admit a reliable source of knowing pervasion between the probans and the probandum.

Text. *Samāropa-vyavacchedakatvāt ca asya prāmāṇyam anumānavat*. (352)

Tran. Since it (*tarka*) separates (or negates) what is assumed, it is a source of knowing like inference.

This is also very similar to the Nyāya view of *tarka* already discussed except that while in the Nyāya view *tarka* is not a source of knowing, in the Jain view it is such a source. The latter view is defended below.

Text. *Pramāṇa-viṣaya-pariśodhakatvāt na ūhah pramūṇam ityapi vārttam; pramāṇa-viṣayasya apramāṇena pariśodhana-virodhāt mithyā-jñānavat prameya-arthavat ca*. (352)

Tran. That *ūha*, since it (only) purifies (*pariśodhana*) the object of a source of knowing, is not a source of knowing is a weak (view). There is contradiction in

the idea of what is not a source of knowing purifying the object of a source of knowing like false awareness with respect to the knowable object.

Since *tarka* includes a false assumption as a premise, it is not a source of knowing in the Nyāya view. However, in the Jain view, the main point of *tarka* is that something cannot be without something else. The reasoning itself is sound and qualifies as a source of knowing. Indeed, only a source of knowing can come to the aid of another source of knowing. (The Jain position may be likened to the practice of allowing more latitude to the prosecution or the defense in cross examining a hostile witness; the procedure still meets the legal standards.)

Text. *Tathā pramāṇam tarkah pramāṇānām augrāhakatvāt, yat pramāṇānām anugrāhakam tat pramāṇam yathā pravacana-anugrāhakam pratyakṣam anumānam vā, pramanāṇām anugrāhakah ca ayam iti.* (353)

Tran. Thus: *tarka* is a source of knowing, for it supports sources of knowing; that which supports sources of knowing is a source of knowing (e.g., perception or inference lending support to an authoritative statement; this too supports sources of knowing).

This is a formal demonstration. As customary in the Sanskrit logical tradition, when the general premise or pervasion is stated, it includes reference to supportive examples to indicate that the generalization is widely confirmed. However, from the Nyāya point of view, the generalization that only sources of knowing can support a source of knowing is open to challenge and subject to the fear of deviation.

Text. *Na ca ayam asiddhah hetuh; pramāṇa-anugrahah hi prathama-pramāṇa-pratipanna-arthasya pramāṇāntareṇa tathā eva avasāyah, pratipatti-dārdhya-vidhanāt. Sa ca atra asti pratyakṣādi-pramāṇaena avagatasya deśatah sādhya-sādhana-sambandhasya dṛdataram anena avagamāt.* (353)

Tran. This mark is also not unsubstantiated (i.e., does not fail to belong to the inferential subject). Support for a source of knowing amounts to knowing an object through another source to be precisely the same as it has first been grasped by a source of knowing; this is for the sake of firmness of knowledge. This also applies here: after the relation between the probans and the probandum is perceptually grasped from places it is made firmer by this.

Text. *Na ca ūhah sambandha-jñāna-janmā yatah apara-apara-ūha-anusaraṇāt anavasthā syāt, pratyakṣa-anupalambha-janmattāt tasya. Sva-yogyatā-viśeṣa-vaśāt ca pratiniyata-artha-vyavasthāpakatvam pratyakṣavat.* (353)

Tran. It is also not that *ūha* arises from awareness of the relation (between the probans and the probandum) so that there is infinite regress from pursuing

(endlessly) successive cases of *ūha*. On the (contrary), it arises from perception and nonapprehension. It is also capable of settling its own object by virtue of its own special fitness like perception.

In the Jain view, perception involves clear (*viśada*) presentation of an object as "that" without the help of any other source of knowing. This is due to the nature of things (*vastu-sthiti*) that must be accepted or else we land in absolute skepticism. Analogously, *tarka* has by way of the nature of things the fitness to reliably determine its own specific object, viz., pervasion, without any further help or else we land in absolute skepticism, for *tarka* is needed for inference that in turn is needed for proving the reliability of any source of knowing. If it is true that something cannot exist without something else, the pervasion of the former by the latter is necessarily true independently (*nirapeksa*) of any other evidence. How do we know that something cannot exist without something else? We know that from apprehension and nonapprehension. Apprehension is not merely observing things together and nonapprehension is not merely lack of observing things together. Apprehension is realizing that if something with certain properties exists, something else with certain properties must also exist (e.g., that if there is smoke, there must be fire that burns fuel or that burning fuel is necessary for smoke to come out). Similarly, nonapprehension is the converse of that: it means realizing that unless something with certain properties exists, something else with certain properties cannot exist, e.g., that unless fuel is burnt smoke cannot emerge.

Text. *Nanu yathā tarkasya svaviṣaye sambandha-grahaṇa-nirapekṣa pravṛttih tha anumānsya api astu . . . tathā ca anarthakam sambandha-grahaṇārtham tarka-parikalpanam; tadapi asamīcīnam . . . Anumānasya . . . utpattih tu liñga-liñgi-sambandha-grahaṇa-nirapekṣa nāsti, agṛhita-sambandhasya pratipattuh kvacit kadācit tat-utpatti-apratīteh. Na ca pratyakṣasya api utpattih kāraṇa-artha-sambandha-grahaṇa-apekṣa pratipanna, svayam agṛhita-sambandhasya api prati-pattuh tat-utpatti-pratīteh. Tadvat ūhasya api svārtha-sambandha-grahaṇa-anapekṣasya utpatti-pratipatteh na utpattau sambandha-grahaṇa-apekṣā yuktimatī.* (353)

Tran. Just as *tarka* effectuates its object without requiring awareness of the relation (between the probans and the probandum), so also is the case of inference; then it is superfluous to hypothesize *tarka* for awareness of the relation. But this also is not right. Inference does not arise independently of awareness of the relation between the probans and the probandum; indeed, that (inference) is never and nowhere known to arise in a knower who is not aware of the relation. But it is not established that the origin of perception also depends on awareness of the relation between the instrument (the sense organ) and the object, for it is known

> to arise in a knower who is himself/herself unaware of that relation. Similarly, *tarka* is known to arise in those who are not dependent on awareness of the relation with its object. Hence it is not reasonable that the origin requires awareness of the relation.

It may be asked: if *tarka* suffices for knowledge of pervasion without any further help, why not grant that to inference itself so that the admission of *tarka* becomes unnecessary? Prabhacandra answers that it is already admitted that inference presupposes pervasion and that the latter, if it were to come from inference, would require another pervasion and so on to infinity. But there is no evidence that shows that *tarka* that gives knowledge of pervasion presupposes another pervasion and so the threat of regress does not arise. For example, inferring that the hill is fiery because it is smoky presupposes that all smoky things are fiery and cannot take place without that awareness. But that smoke cannot be without fire does not presuppose that all smoky things are fiery but rather provides the basis for the latter. Hence claiming that *tarka* presupposes pervasion would amount to putting the cart before the horse. How do we know that smoke cannot be without fire? From perception and nonperception—that is, from seeing that a thing with the properties of smoke is if there is a thing with the properties of fire and that if a thing with the properties of fire is not a thing with the properties of smoke is not either. This is similar to the way of perception. Perception takes place irrespective of whether one is aware of the relation between the sense organ and the sensed object. In a similar way *tarka* takes place irrespective of if one is aware of the relation between the pervaded and the pervader.

11

Selections from Dharmakirti's *Nyāyabindu* on Nonperception as a Probans

We have seen that in the Buddhist view pervasion is based on identity or non-difference (*abheda*)—that is, (the probans) being of the same nature as that (the probandum): *tādātmya*). Alternatively, pervasion is based on causation (*tadutpatti*). Accordingly, a probans is also classified to be of two kinds, viz., a probans through identity (*svabhāva-hetu*) and an effect as a probans (*kārya-hetu*). However, in the *Nyāyabindu* Dharmakirti (DK) mentions a threefold classification of the probans, viz., a probans through identity, an effect as a probans and a probans through nonperception (*anupalabdhi*). (*Trīṇi eva liṇgāni*, NBD 2.10; *anupalabdhih svabhāvah kāryam ca iti*, NBD 2.11) Does this mean rejecting the twofold classification that even DK has endorsed in his other works such as the PV (e.g., PV 3.33–34)? No, for DK holds that the third kind of a probans through nonperception is included in the first kind of a probans through identity. In fact, a probans through identity may lead to an affirmative or a negative conclusion. When a probans through identity leads to an affirmative conclusion, it is called by the same name of a probans through identity; when such a probans leads to a negative conclusion, it is called a probans through nonperception. A probans through nonperception is still a probans through identity in the proper sense, for here also the probans is related to the probandum by way of identity or nondifference and is of the same nature as the probandum.

We now discuss nonperception (*anupalabdhi*) as a probans to reach a negative conclusion in Buddhist logic as mainly developed by Dharmakirti. For some others (such as Isvarasena, an early Jain philosopher,) nonperception, as the negative particle may suggest, means merely absence of perception (*Kecit upalabdhi-abhāva-mātram anupalabdhim . . . gamikām icchanti īśvarasena-*

pravṛtayah, HB 167). This view may have the following difficulty if it is held that the specific causal conditions of inference are not merely present (as are the specific causal conditions of perception before perception) but are also cognized to be present before an inference. Then the question is: how is such absence of perception cognized? If it requires another absence of perception to be cognized and if the latter needs yet another absence of perception and so on, there is the threat of an infinite regress. Further, in the Buddhist view absence is not known through perception and can only be grasped through inference. Thus, if nonperception is merely absence of perception, it can only be grasped inferentially. But then what can be the probans for such an inference to grasp absence? No positive entity can be the probans, for being positive is opposed to being negative. So only another negative entity can be the probans and the latter can be cognized only through yet another negative entity and so on; an infinite regress is then too inevitable.

Accordingly, for DK nonperception is not merely absence of perception but another perception (*tasmāt anyā upalabdhih anupalabdhih*, HB 64). When both of two things could be equally perceived by the same sense organ in the same awareness, then if one is perceived and the other is not, it transpires that if the latter were there it would have been perceived like the former (*Tasmāt eka-jñāna-samsargiṇi dṛśyamāne sati ekasmin itarat samagra-darśana-sāmagrīkam yadi bhavet dṛśyam eva bhavet iti sambhāvitam dṛśyam āropyate*, NBD 102). Thus perception of one amounts to nonperception of the other. For example, if a pot were on the floor, since both the pot and the floor could be equally perceived in the same act of perception, the pot too would have been perceived when the floor is perceived. But if the floor is perceived and not the pot, it transpires that the pot is not there and thus the perception of the floor amounts to nonperception of the pot. From this it may be inferred that the pot is absent there. In this inference that place is the inferential subject, absence of the pot is the probandum and nonperception of the pot that should have been perceived is the probans (NBD 2.12). Since nonperception of the pot that should have been perceived reduces to an act of perception of the floor, there is no threat of an infinite regress.

DK has offered a threefold classification of nonperception as a probans in the HB (68), viz., nonperception of the causal condition (*kāraṇa-anupalabdhi*), nonperception of the pervader (*vyāpaka-anupalabdhi*) and nonperception of presence of itself (*svabhāva-anupalabdhi*). But in the PV (3.3), DK has said that nonperception is of four kinds, viz., the three mentioned above (though now nonperception of the causal condition is called *hetu-anupalabdhi*, where *hetu* and *karana* may both mean a causal condition) plus nonperception of the opposed (*viruddha-anupalabdhi*). However, a more elaborate elevenfold classification is found in the NBD. Once again, there is no insuperable conflict

among these classifications. The classification in the NBD includes the types mentioned in the HB and the PV and throws more light by introducing some more distinctions. Further, according to DK, the other ten kinds of nonperception mentioned in the NBD are subsumed in the first kind called nonperception of presence of itself which is also mentioned in the classifications provided in the HB and the PV. We move on to explain the eleven kinds of nonperception cited in the NBD.

Text. (1) *Svabhāva-anupalabdhih yathā na atra dhūmah upalabdhi-lakṣaṇa-prāptasya anupalabdheh iti*. (2.31)

Tran. Nonperception of presence (or nature) of itself (the negatum) (*svabhāva-anupalabdhi*)—for example, smoke is not here, for it is not perceived (here) in spite of the conditions of perception (other than its presence) being fulfilled.

As the name suggests, the probans is nonperception of presence (*bhāva*) of that which is to be negated or the negatum (*pratiṣedhya*)—that is, nonperception of the negatum itself is the probans for inferring absence of the negatum. In the cited example nonperception of perceptible smoke is the probans, "here" or the given location is the inferential subject and lack of smoke is the probandum and smoke is the negatum. Following Durveka Misra (DM 125) the steps of the given inference may be indicated as follows. All things that are not perceived in spite of the conditions of perception (other than its presence) being fulfilled are appropriate objects of negation where they are not perceived—for example, the horn on the head of a horse (*yat yatra upalabdhi-lakṣaṇa-prāptam sat nopalabhyate tat sarvam tatra asat-vyavahāra-yogyam, yathā turañgama-uttamāñge śṛñgam*). And smoke is not perceived here in spite of the conditions of perception (other than its presence) being fulfilled (*na upalabhyate ca atra upalabdhi-lakṣaṇa-prāptah dhūmah*).

If the given inference were to be reformulated in three steps including the conclusion (although the conclusion is not explicitly stated by the Buddhists and left implied), these would be as follows.

Premise 1: All perceptible things that are not perceived somewhere are appropriate objects of negation where they are not perceived—for example, the horn on the head of a horse.
Premise 2: Smoke that is perceptible is not perceived here.
Conclusion: Smoke is an appropriate object of negation here (i.e., there is no smoke here).

This inference may be restated as follows. All perceptible things that are not perceived somewhere are absent there, such as the horn on the head of a

horse. This is where smoke that is perceptible is not perceived. Therefore this is where smoke is absent.

In the given example the inferential subject happens to be a singular term. We should not draw from this the conclusion that in an inference the inferential subject is always a singular term. In the text "nonapprehension of its presence" is broad enough to allow for the inferential subject to be a general term as well.[1] Accordingly, the following too could be an example of this kind of probans (assuming that the context is something like a desert where there is no water anywhere and all other conditions of perception are fulfilled):

Premise 1: All perceptible things that are not perceived are appropriate objects of negation where they are not perceived—for example, the horn on the head of a horse.
Premise 2: Water that is perceptible is not perceived anywhere.
Conclusion: Water is an appropriate object of negation everywhere (i.e., there is no water anywhere).

This inference may be restated as below. All perceptible things that are not perceived somewhere are absent there, such as the horn on the head of a horse. All places are places where water that is perceptible is not perceived. Therefore, all places are places where water is absent.

In the Sanskrit logical tradition we have expressions like *pakṣa-vṛtti* (belongs to the inferential subject) as distinguished from *pakṣa-vyāpaka* (pervades the inferential subject). [For example, see the Hetucakra in the *Nyāyavārttika* of Uddyotakara with which Dharmakirti is familiar.] The former expression rules out that the probans is absent in the inferential subject but does not require that the probans pervasively belongs to the inferential subject. The latter expression rules out that the probans is absent in a part (*ekadeṣa*) of the inferential subject.

Based on this, "belonging to the inferential subject" may be interpreted to cover also the following case in the given example. All perceptible things that are not perceived somewhere are absent there, such as the horn on the head of a horse. Some places are places where water that is perceptible is not perceived. Therefore, some places are places where water is absent.

Since these are cases of probans, the premises are required to be reliable. That is, if one is challenged, one should be able to justify making such claims as that all perceptible things that are not perceived somewhere are absent there, that all places are places where water that is perceptible is not perceived, that some places are places where water that is perceptible is not perceived or that this is a place where water that is perceptible is not perceived. Much of such justification would be founded on perception. However, the epistemic

status of general propositions like all perceptible things that are not perceived somewhere are absent there is not clear. Are these empirical inductions? Are these analytic or synthetic? Are these *a priori* or *a posteriori*? Or is the analytic-synthetic dichotomy or the *a priori–a posteriori* dichotomy unhelpful in understanding the present issue? These questions deserve a careful and serious study that we cannot undertake here due to the limitation of space.

It may be noted that while examples of unsound inferences where the conclusion is a particular proposition are not rare in the Sanskrit logical tradition, examples of sound inferences where the conclusion is a particular proposition are rare in that tradition before the rise of Navya-Nyāya. Still it does not follow that such inferences are not permissible in pre-Navya-Nyāya Sanskrit logic. Rather, the concept of "belonging to the inferential subject" suggests that these are permissible.[2]

> Text. (2) *Kārya-anupalabdhih yathā na atra apratibaddha-sāmartyāni dhūma-kāraṇāni santi dhūma-abhāvāt iti*. (2.32)

> Tran. Nonperception of the effect (*kārya-anupalabdhi*) (of the negatum)—for example, causal conditions with unimpeded ability of smoke is not here for there is absence of smoke (here).

As distinguished from the previous case where nonperception of the negatum itself is the probans, here nonperception of the effect of the negatum is the probans for inferring absence of the negatum. That is, in this case the negatum is the cause of what is not apprehended. In the Buddhist view stemming from the doctrine of momentariness a cause becomes causally active (*kurvadrūpa*) in the final moment (*antya-kṣaṇa*) immediately preceding the origin of the effect. At other times a cause is not causally active and is not possessed of the unimpeded ability (*aprativaddha-sāmarthya*) to produce the effect. The effect comes into being only when the cause is possessed of the unimpeded ability to produce the effect. Thus absence of the effect is a sure sign of absence of the cause of unimpeded ability.

Dharmottara (DHM 2.32) suggests that this second kind of nonperception is appropriate as a probans for inferring absence of the cause if it is imperceptible and not if it is perceptible. In the latter case nonapprehension of such a cause that is perceptible suffices as a probans for inferring its absence: and that is covered in the first kind of nonapprehension.

Dharmottara clarifies that in the inference of absence of fire with impeded ability to produce smoke from the absence of smoke the inferential subject may be partly perceived and partly unperceived. For example, a man on the top of a house may see only the top part of the boundary wall and not the bottom part. If there were smoke producing fire in the unperceived bottom part, smoke

would have traveled upward and been found in the top part. Since smoke is not seen in the top part, one may infer that there is no smoke producing fire in the bottom part. One may also infer that there is no smoke producing fire in the top part although this may also be gathered through the first kind of nonapprehension. If this makes sense, both the bottom and the top part are the inferential subjects a part of which is perceived and a part unperceived.

Dharmottara adds that such an aggregate of the perceived and the unperceived becomes the inferential subject in other cases as well. Durveka Misra (DM 127–28), commenting on Dharmottara, remarks that in the Buddhist view only a unique particular (*svalakṣaṇa*: literally, self-defined) becomes the object of perception. In this view things like hills that are fitted with general descriptions are not objects of perception. If one infers fire or absence of fire in the hill, only the unique particular there is perceived and the rest is unperceived. Thus the inferential subject may very well be an aggregate of the perceived and the unperceived in many cases.

In the Nyāya view if the sum total (*sāmagrī*) of the causal conditions (that includes lack of obstructing factors: *pratibandhaka-abhāva*) of an effect is available, the effect cannot fail to be there. Thus absence of the effect proves absence of the sum total of the causal conditions of an effect. In the given example, absence of smoke suffices to prove that the sum total of the causal conditions of smoke is not available.

It is clear from the above that the issues are not confined to formal logic. Still, underlying formal laws may be elicited from the above discussion. The implication is that if there is the cause with unimpeded ability, there is the effect and since the effect is not, there is also not the cause with unimpeded ability. Thus the implied formal rule may be stated in the propositional version (it may alternatively be also stated with complex terms) as: if P, then Q, not Q, therefore, not P. It will be clearer as we look at other cases that DK is utilizing formal relations as well.

It may be seen also that nonexistence of the effect by itself alone (*sva-sattā-mātra-bhāvini*) suffices to prove nonexistence of the causal condition and the former is nondifferent (*abhinna*) from the latter. Thus nonperception of the effect is of the nature of (*tadātma*) nonperception of the causal condition and included in the first kind of nonperception of presence or nature of itself.

Text. (3) *Vyāpaka-anupalabdhih yathā na atra śimśapā vṛkṣābhāvāt iti*. (2.33)

Tran. Nonperception of the pervader (*vyāpaka-anupalabdhi*) (of the negatum)—for example, there is no *śimśapā* (a kind of tree) here for there is no tree (here).

As distinguished from the two previous cases it is not nonperception of the negatum itself or nonperception of the effect of the negatum but nonpercep-

tion of the pervader of the negatum is the probans in this case for inferring absence of the negatum. That is, in this case the negatum is the pervaded (*vyāpya*) of what is not apprehended.

In the Nyāya view the pervaded is that which does not have a wider extension (*anatirikta-deśa-vṛtti*) and the pervader is that which does not have a smaller extension (*anyūna-deśa-vṛtti*). While this is acceptable to the Buddhists, in the latter view pervasion is a natural connection (*svabhāva-pratibandha*) founded on identity (*tādātmya*) or causation (*tadutpatti*). And because of that the pervaded cannot be without the pervader.

In the cited example what is inferred in a given location is absence of the *śimśapā*, a kind of tree, from the absence of any tree. Being a *śimśapā* is naturally connected to being a tree. Nothing can be a kind of tree without being a tree: in this way being a *śimśapā* and being a tree are related by way of identity (*tādātmya*) and absence of any tree guarantees absence of any *śimśapā* too. The operative relation is nevertheless that of the pervaded and the pervader. It is not permissible to infer absence of the pervader from absence of the pervaded. It is only permissible to infer absence of the pervaded from absence of the pervader. Again, as pointed out earlier, the inferential subject need not always be a singular term and may very well be a general term. Thus the following could also be cases of this kind of inference including the conclusion. (A) All places without trees are also places without *śimśapā* (e.g., a kitchen). Some places are places without trees. Therefore, some places are places without *śimśapā*. (B) (In the context of something like a desert) all places without trees are also places without *śimśapā* (e.g., a kitchen). All places are places without trees. Therefore, all places are places without *śimśapā*.

It goes without saying that DK and others are interested in much more than formal validity. Still formal validity is an element in what is acceptable as a probans. That is, a formally invalid inference is not acceptable as a case of a probans. This is why inferring absence of the pervader from absence of the pervaded is not permissible, for that is formally invalid. Formally invalid inferences are not excluded by accident: DK and others must have done this deliberately though they set a standard higher than formal validity.

DM (130) explains this case as follows: Where the pervader is not that is not there—for example, (lack of) knowability in the absence of the knowable. Being a tree that pervades *śimśapā* is absent. The conclusion that DM leaves understood is: therefore, there is no *śimśapā* there.

In DM's explanation the general premise is: where the pervader is not the pervaded is not. From the perspective of modern logic subscribing to the analytic-synthetic dichotomy this general premise is analytic and a logical truth. For DM following DK this premise is a generalization based on the natural connection of identity. That is, the subject and the predicate of the general

proposition are related by way of identity in the sense that the subject is of the nature (*svabhāva*) of the predicate and nothing can be of the nature of the subject without also being of the nature of the predicate. In other words, nothing can be of the nature of the probans (*hetu-svabhāva*) without also being of the nature of the probandum (*sādhya-svabhāva*). That is why the mere presence of the property signified by the subject without recourse to anything else is a sure sign of the presence of the property signified by the predicate (*svabhāvah sva-sattā-mātra-bhāvini sādhya-dharme hetuh*, NBD 2.15). In the given example, absence of the pervader is the probans for absence of the pervaded. Since absence of the pervader is of the nature of absence of the pervaded, the former cannot be realized without the latter also being realized. From this perspective, the laws of logic appear to be also the laws of being in the world of construction (*vikalpa*). DM's supportive example of absence of knowability in the absence of the knowable helps us to see the point in a way similar to the way in which the diagram of a triangle may help us to see, for example, that if the two angles of a triangle are equal, the two sides are also equal.

It is also clear that since nonperception of the pervader is nondifferent (though conceptually distinguishable) from nonperception of the pervaded, this third case may be included in the first kind of nonperception of itself.

Text. (4) *Svabhāva-viruddha-upalabdhih yathā na atra śīta-sparśah agneh iti.* (2.34)

Tran. Perceiving what is opposed to the nature or the very presence (of the negatum)—for example, there is no cold touch here because of fire (here).

Something is opposed to something if the presence of the one excludes the presence of the other. Hence, if something is opposed to the negatum, the presence of that opposed thing suffices to prove absence of the negatum. In the cited example fire that is hot by its very nature excludes cold touch. Here the probans speaks of perceiving something opposed that necessarily involves nonperception and hence this case too can be indirectly regarded as a case of nonperception.

While the opposition between cold touch and fire may be observed, this kind of probans is founded on opposition that should also be understood as implying a formal relation. As already said, two things are opposed if one excludes the other and this is a formal relationship. It should be kept in mind though that, while in the view of many recent analytic philosophers formal truths are factually empty, in the Buddhist perspective the formal laws are also laws of being for constructed entities (*vikalpa*).

It may be noted that since perception of what is opposed to itself is of the nature of (though notionally distinct from) nonperception of itself, this fourth kind is included in the first kind of nonperception of itself.

Text. (5) *Viruddha-kārya-upalabdhih yathā na atra śīstasparśah dhūmāt iti.* (2.35)

Tran. Perception of that which is the effect of what is opposed (to the negatum)—for example, there is no cold touch here because of smoke.

This is the case where absence of the negatum in a given place is inferred from perception of the presence there of the effect of what is opposed to the negatum. DM (131–32) observes that for those who are very familiar with the situation this may be treated as a single inference as follows: where there is a certain kind of smoke there is absence of cold touch—for instance, in a kitchen and so on. Such smoke is here. (So there is absence of cold touch here.) For others who are not familiar with the situation this may be in two steps. First, presence of the effect shows presence of the causal condition. This is an inference from the effect as a probans. Then (if that causal condition is opposed to the negatum) from apprehension of what is opposed to the negatum follows absence of the negatum (*viruddha-upalambhaja*). In the cited example it is inferred from smoke in a given place that there is also there fire of which smoke is the effect. Since fire is opposed to cold touch, from the presence of fire there is inferred absence of cold touch there.

It may be seen that since perception of the effect of what is opposed to itself is necessarily connected to or of the nature of nonperception of itself, the fifth kind may be included in the first.

Text. (6) *Viruddha-vyāpta-upalabdhih yathā na dhruvabhāvi bhūtasya api bhāvasya vināśah hetu-anatara-apekşanāt iti.* (2.36)

Tran. Perception of that which is pervaded by what is opposed (to the negatum)—for example, destruction of an originated positive thing too is not necessary because of dependence (of destruction) on a cause different from (the originating cause).

What is opposed to the negatum necessarily excludes the latter. In a similar way, what is pervaded by what is opposed to the negatum also necessarily excludes the latter. Thus absence of the negatum follows necessarily from presence of what is pervaded by what is opposed to the negatum. The formal structure of this kind of probans may be shown as below. Please note that in this chapter, for the purpose of formalization, "=" stands for material implication, "(X)" stands for the existential quantifier and "?" shows the conclusion.

(X) (Mx = ~Px)
(X) Mx [or (X) (Sx = Mx)]
? (X) ~Px [or (X) (Sx = ~Px)]

Another possibility of course is as below.

(X) (Mx = ~Px)
Ma
? ~Pa

The other possibility is as below.

(X) (Mx = ~Px)
(Ex) Mx [or (Ex) (Sx & Mx)]
? (Ex) ~Px [or (Ex) Sx & ~Px)]

The example of DK is philosophically interesting, viz., originated positive things are not destroyed necessarily, for their destruction depends on causes other than the originating cause. That is, dependence of destruction on other causes is pervaded by lack of necessary destruction.

This goes deep into the ontological disagreement between the Nyāya and the Buddhists over the doctrine of momentariness. According to the latter, to which the Buddhists subscribe, a thing is destroyed by its originating cause so that destruction does not depend on anything else and always takes place in the moment immediately after the moment of origin. But the Nyāya subscribes to permanence and holds that destruction depends on other factors beside the originating causal conditions so that things endure until those other factors are available. DK argues that in that case destruction of a positive entity that comes into being may never take place. This goes against the Nyāya thesis that all positive (*bhāva*) entities that come into being are subject to destruction.

This example uses the premise that destruction depending on other factors may never take place though in the Buddhist view destruction does not depend on other factors and is necessary for anything coming into being. This is known as *abhyupagama-vāda* when one argues from an unaccepted assumption. DK's point is that if destruction were dependent on other factors, it may never happen. Since the latter is not acceptable, the former, viz., that destruction depends on other factors, too is not acceptable and so things are momentary.

If the above reading makes sense, it is significant that DK is willing to argue from an unaccepted assumption within the context of a *hetu* or probans. This supports our view that DK is well aware of formal validity although he goes much beyond formal validity. His example is similar in spirit to the following formally valid but unsound argument.

All men are immortal.
Udayana is a man
? Udayana is immortal.

It is false that all men are immortal and that Udayana is immortal; still, one can argue to that effect in a formally valid way. Similarly, it is false from the Buddhist (as well as the Nyāya) viewpoint that all originated positive things the destruction of which depends on other things are such that their destruction is not necessary. It is also false from the Buddhist viewpoint that this thing is such that its destruction is not necessary. Still, this conclusion follows in a formally valid way given the above (false) general premise and the premise that this is an originated positive thing.

It is worth noting that cases of *hetu* with a false premise are also found in Uddyotakara's *hetu-cakra*. In general, arguing in a formally valid way from unaccepted or false assumptions is common in Indian philosophy.

DK's example may be explained following DHM as follows. The destruction of an originated positive entity is not everlasting because of dependence on causal conditions other than those of that entity. The point is that although the destruction of a thing immediately after the origin is inevitable in the light of the doctrine of momentariness, the transformation of the condition of that thing from one state to a different state depends on other factors. For example, a piece of white cloth does become destroyed immediately after its origin but can turn into red only if there is another causal condition for the change of the color. Accordingly, destruction cannot be everlasting as the Nyāya claims. From the Buddhist point of view since existence and nonexistence are opposed, they cannot be due to the same set of causal conditions. So destruction must be due to additional causal conditions not needed for the origin of the thing. It follows that destruction is not everlasting, for nothing for which adventitious factors are needed can be everlasting.

Since perception (or existence) of what is pervaded by what is opposed to itself necessarily involves nonperception (or nonexistence) of itself, the sixth kind too is included in the first kind.

Text. (7) *Kārya-viriddhu-upalabdhih yathā na iha aprativaddha-sāmarthyāni śīta-kāranāṇi santi, vahneh iti*. (2.37)

Tran. Perception of what is opposed to the effect (of the negatum)—for example, here are not causes of cold that are unobstructed and capable, for (there is) fire.

"Causes of cold that are unobstructed and capable" is the negatum. This is negated on the basis that something opposed to the effect of the negatum is present. If something opposed to the effect is present, the effect is not present. If the effect is not present, unobstructed and capable causes of the effect are too not present. The reasoning is necessary. If unobstructed and capable causes of an effect are present, the latter is present without fail. The necessity is indicated by the fact that the causes are specified to be capable

and of unobstructed capacity. By definition, if causes fail to produce the effect, their capacity is obstructed. It is self-contradictory to say that capable causes of unobstructed capacity are present but the effect is not. However, absence of causes of unobstructed capacity of the effect is not derived directly from absence of the effect but indirectly from presence of what is opposed to the effect. This part of the reasoning too is necessary. If something opposed to something is present, the latter must be absent. Once again, the reasoning is highly sophisticated and shows a clear grasp of formal relationships.

In the example, absence of causes of unobstructed capacity of cold is inferred from presence of fire that is opposed to cold. DM remarks that by fire is meant specifically what is capable of removing cold (NBD 134). The example is a blend of deduction and induction and, given the antiquity, shows a remarkable level of progress in the study of the scientific method.

It should be kept in mind that each kind of probans based on nonapprehension is a case of the relation of identity (*tādātmya*). In this case absence of causes of unobstructed capacity of an effect is inferred from presence of what is opposed to the effect. That is, presence of what is opposed to the effect is related by way of identity to absence of causes of unobstructed capacity of the effect. As DK has explained the nature of identity, it is impossible for the former to be realized without the latter being realized. The relation is necessary, though given DK's epistemology and ontology, no claim is made about the ultimate nature of things but the necessity holds in the world of construction (*vikalpa*). DK reminds us of the limited claim by speaking of apprehension (*upalabdhi*). Since perception of what is opposed to the effect of the negatum cannot be without nonperception of the negatum, this kind is also included in the first.

Text. (8) *Vyāpaka-viruddha-upalabdhih yahā na atra tuṣāra-sparśah vahneh iti.* (2.38)

Tran. Perception of what is opposed to the pervader (of the negatum)—for example, there is not here the touch of ice because of fire.

When two things are opposed, if one is present, the other must be absent. Thus presence of what is opposed to the pervader of the negatum guarantees absence of the pervader of the negatum. Next, absence of the pervader of the negatum guarantees absence of the negatum. DK is explicitly using formal relations like being opposed and being the pervader to ensure that the conclusion follows necessarily. The formal part of the reasoning may be reformulated as below (by confining, to save space, only to the case with the universal conclusion):

(X) (Fx = ~Sx)
(X) (~Sx = ~Tx)
? (X) (Fx = ~Tx)

In the example, touch of ice is meant to be pervaded by touch of cold. Fire is taken to be opposed to touch of cold. Thus from fire is inferred absence of touch of cold and from the latter is inferred absence of touch of ice, as DM suggests (NBD 136). DM adds that the inference should still be taken as a single argument and we have accordingly in our reformulation presented it as such. Once again, the example involves both deduction and induction and, given the early date of DK, shows a remarkable level of development in the study of scientific method. This kind too is included in the first, for perception of what is opposed to the pervader of the negatum is of the nature of nonperception of the negatum. Similar remarks apply to the remaining cases.

Text. (9) *Kāraṇa-anupalabdhih yathā na atra dhūmah vahni-abhāvāt iti*. (2.39)

Tran. Nonperception of the cause (of the negatum)—for example, there is not smoke here because of lack of fire.

In this ninth case the negatum is an effect. An effect does not come into being without the cause (that is a necessary condition). So absence of the cause warrants inference of absence of the effect. The example gives an instance of this general causal formula. Fire is the cause of smoke Hence from absence of fire in the given place is inferred absence of smoke.

DM makes a similar point in his explanation: Where there is not the cause of something there the latter is not, for instance, (lack of) sapling in case of lack of the seed. Here too is not fire that is the cause of smoke (*Yatra yasya kāraṇam nāsti na tat tatra asti, yathā bīja-abhāve amkurah; nāsti ca atra dhūmasya kāraṇam vahnih*, NBD 137). It may be noticed that DM first enunciates the general causal formula and then moves to fire and smoke as an instance of it.

It may also be noticed that while DK speaks of nonperception consistently with his epistemic-ontological position, it boils down to absence. DK means nonperception of something when all other conditions of perception are fulfilled. Thus by implication the thing not being perceived is absent, for if it were present, it would have been perceived. In fact, DK says explicitly that what follows necessarily from nonperception is absence (*Tasya eva abhāva-niścayāt*, 2.29). Hence, in spite of the appearance, these arguments should not be thought to exemplify an "argument from ignorance."[3] The example of DK helps to see this. What is inferred is absence of smoke from absence of fire.

Text. (10) *Kāraṇa-viruddha-upalabdhih, yathā na asya roma-harṣādi-viśeṣah sannihita-dahana-viśeṣatvāt iti.* (2.40)

Tran. Perception of what is opposed to the cause (of the negatum)—for example, this person does not have the specific kind of horripilation and so on (due to cold touch) because of the specific kind of fire (that removes cold touch) close by.

In this tenth case (as in the ninth case) the negatum is an effect. In the ninth case absence of the effect is inferred from absence of the cause. Now absence of the effect is inferred from presence of what is opposed to the cause. Presence of what is opposed to the cause guarantees absence of the cause by virtue of the logical relation of opposition and absence of the cause (that is a necessary condition) guarantees absence of the effect. In the given example, from the fact that a person is close to a fire that suffices to remove cold touch (and make him warm) is inferred that he does not have horripilation due to cold touch, for that fire removes cold touch that causes horripilation and so forth.

DM remarks that this case may be treated as a single inference as follows. Where there is what is opposed to the cause of something there the latter thing is not—for instance, absence of cold ailment in case of (abundance of) bile that is opposed to cold. And there is fire that is opposed to horripilation (NBD 138). It may be noticed that DM again first enunciates the general formula and then moves to fire opposed to cold touch causing horripilation and so on as an instance. The general formula is the product of the logical relation of opposition and the causal relation and is highly sophisticated. Without any doubt this general formula is implied in the aphorism of DK.

DM adds that the case may, instead of being treated as a single inference, be otherwise treated as two inferences as follows. (1) Where there is fire there is not cold touch. This is based on perception of what is opposed and, if so interpreted, falls under the fourth kind of probans based on nonperception mentioned above. (2) Where there is absence of cold touch there is not horripilation and so forth that are the effects of cold touch. This is based on nonperception of the cause and, if so interpreted, falls under the ninth kind of probans based on nonperception (NBD 138).

Text. (11) *Kāraṇa-viruddha-kārya-upalabdhih yathā na romaharṣādi-viśeṣa-yukta-puruṣavān ayam pradeśah, dhūmat iti.* (2.41)

Tran. Perception of the effect of what is opposed to the cause (of the negatum)—for example, this place does not have a person with a particular kind of horripilation and so forth because of smoke.

In the ninth case absence of the effect is inferred from absence of the cause and in the tenth case absence of the effect is inferred from presence of what is

opposed to the cause (that guarantees absence of the cause and that in turn guarantees absence of the effect that is the negatum). In this eleventh case, absence of an effect is inferred from presence of the effect of what is opposed to the cause of the negatum. The presence of the effect warrants inferring presence of the cause. Since this cause is opposed to the cause of the negatum, presence of the former guarantees absence of the cause of the negatum and absence of the cause (that is a necessary condition) guarantees absence of the effect that is the negatum. Thus the cases nine and ten lead progressively to the case eleven that utilizes the fundamentals of the causal relation as well as the formal relation of opposition and all this amounts to a substantial contribution to the methodology of science. Without doubt such a level of progress in the study of scientific method is not found in contemporary non-Indian logical traditions.

In the given example from the fact that there is a particular kind of smoke that is caused by a particular kind of fire that suffices to remove cold touch that causes a particular kind of horripilation, it is inferred that in the given location there is no person with the particular kind of horripilation. Although DK speaks of merely smoke in the example, the commentators like DHM emphasize that smoke here means a particular kind of smoke that can only be caused by a particular kind of fire that is opposed to cold touch causing the particular kind of horripilation.

DM comments that this case may be presented as a single inference as follows. Where there is the effect of something that is opposed to the cause of something there the latter thing is not—for instance, absence of a particular kind of smile in case of a particular kind of crying. And here is smoke that is the effect of fire that is opposed to cold touch that in turn is necessary for the presence of a person with a particular kind of horripilation. Again, DM first states the general premise with a supporting example (that summarily indicates the inductive evidence) to show that the generalization is reliable. Then the second premise states that the probans (in the example "smoke that is the effect of fire that is opposed to cold touch that is necessary for a person to have a particular kind of horripilation and so forth") belongs to the inferential subject (in the example "this place"). The conclusion that the probandum belongs to the inferential subject is left understood following the practice in the Buddhist logical tradition. Once again, although the inferential subject is a singular term in the given example, one should not jump to the conclusion that only singular terms are permitted as the inferential subjects. There is no such restriction in the scheme of the inference laid down by DK and there is no evidence to rule out that the inferential subject could be universally or existentially quantified.

DM adds that this case may otherwise be viewed as a set of three inferences involving, first, (*kārya-hetu*) the effect as the probans (to infer the cause),

then, second, (*viruddha-upalabdhi*) perception of something opposed (to the cause of the negatum to infer absence of the cause of the negatum) and, third, (*kāraṇa-anupalabdhi*) nonperception of the cause (of the negatum to infer absence of the negatum as the effect). Thus in the given example there is first the inference that where there is smoke there is fire that is a case of inference from the effect as the probans. Second, there is the inference that where there is fire there is no cold touch that is a case of inference from apprehension of the opposed (fire being opposed to cold touch). Third, there is the inference that where there is absence of cold touch there is absence of a person with a particular kind of horripilation and so forth (that is the effect of cold touch). It should be noticed that in presenting the example as a set of three inferences DM has stated each of the three as a general proposition. This suggests that not only inferences with singular terms as the inferential subjects but also inferences with general terms as inferential subjects are permitted.

DM remarks further that the list of eleven kinds of nonapprehension as probantia is not exhaustive. Some others are as follows.

1. Perception of the effect of what is opposed to the pervader of the negatum (*vyāpaka-viruddha-kārya-upalabdhih*). The presence of the effect warrants inferring presence of the cause (as a case of the effect as the probans: *karya-hetu*). Since the said cause is opposed to the pervader, it follows that the pervader is absent. This falls under the fourth kind of nonperception, viz., perceiving what is opposed to the presence of itself (*svabhāva-viruddha-upalabdhih*). From absence of the pervader follows absence of the negatum (the pervaded) as a case of the third kind of nonperception, viz., not perceiving the pervader of the negatum (*vyāpaka-anupalabdhih*). For example, there is no touch of snow here because of smoke. Smoke is the effect of fire; thus it follows that fire is present. Fire is opposed to cold touch; it follows that cold touch is absent. Cold touch pervades the touch of snow; it follows that the touch of snow is absent. Following the lead of DM we may view this as a set of three inferences as indicated above. Or we may view this as a single inference as follows. Where there is the effect of what is opposed to the pervader of the negatum the negatum is not (*yatra pratiṣedhya-vyāpaka-viruddha-kārya-upalabdhih tatra tat nāsti*). Here is smoke that is the effect of fire that is opposed to cold touch that pervades the touch of snow.
2. Perception of the effect of what is opposed to the effect (*kārya-viruddha-kārya-upalabdhih*). From presence of the effect that is opposed to the effect of the negatum follows presence of the cause that is opposed to the negatum. From presence of what is opposed to the negatum follows absence of the negatum. For example, there are not

here unobstructed and capable causes of cold touch because of smoke. From smoke we may infer fire that is opposed to cold touch. From presence of what is opposed to cold touch we may infer absence of cold touch. From absence of cold touch we may infer absence of unobstructed and capable causes of cold touch. It may be noticed that unobstructed and capable causes mean the sufficient condition and not the necessary condition. The sufficient condition warrants inferring the effect and absence of the effect warrants inferring absence of the sufficient condition. But the necessary condition does not warrant inferring the effect and absence of the effect does not warrant inferring absence of the necessary condition.

3. Perception of something pervaded by what is opposed to the pervader of the negatum (*vyāpaka-viruddha-vyāpta-upalabdhih*). Presence of the pervaded guarantees presence of the pervader as a case of its own nature (*svabhāva*) as the probans (in such a case something cannot possibly be of the nature of the probans without also being of the nature of the probandum—for example, something cannot possibly be a rose without also being a flower). Since the said pervader is opposed to the pervader of the negatum, it follows logically that the pervader of the negatum is absent. This falls under the above cited fourth kind of nonperception of perceiving what is opposed to the presence of itself. From absence of the pervader it follows necessarily that the pervaded or the negatum is absent. It may be noticed that each of these three inferences is based on a purely formal relationship. It may also be noticed that while these may be treated as a set of three inferences, following the lead of DM, it may also be treated as a single inference as follows. Where there is something pervaded by what is opposed to the pervader of the negatum the negatum is not (*yatra pratiṣedhya-vyāpaka-viruddha-vyāpta-upalabdhih tatra tat nāsti*).

While DM does not list any more cases he observes that one may also coin such additional kinds of nonapprehension as cases of probans. Here are three samples of what DM has in mind.

1. Perception of what is opposed to the pervader of the pervader of the negatum (*vyāpaka-vyāpaka-viruddha—upalabdhih*).
2. Perception of something pervaded by what is pervaded by what is opposed to the pervader of the negatum (*vyāpaka-viruddha-vyāpta-vyāpta-upalabdhih*).
3. Nonperception of the pervader of the pervader of the negatum (*vyāpaka-vyāpaka-anupalabdhih*).

DK's enumeration of the eleven cases is systematic. He starts with the three cases of nonperception of either (1) the negatum's presence or (2) of the negatum's effect or (3) of the negatum's pervader. Then he introduces the logical operation of opposition and generates three more cases by applying it to each of the first three: apprehension of (4) what is opposed to the negatum's presence or (7) of what is opposed to the effect of the negatum or (8) of what is opposed to the pervader of the negatum. Then he sees that not only what is opposed but also what naturally presupposes the opposed warrants inferring absence of the negatum. There are only two possibilities here given the prior classification of a probans as either a case of a thing's own nature (*svabhāva*) or the effect (*kārya*). So he gets the two more cases of perception of (5) the effect of what is opposed to the negatum and of (6) something pervaded by what is opposed to the negatum. In the ninth case he brings the concept of the cause and lists (9) nonperception of the cause as a probans of this kind. Then he applies the logical operation of opposition to the cause and gets the next (10) case of perceiving what is opposed to the cause. Finally, he links the cause with the fifth case and gets (11) the last case of perceiving the effect of what is opposed to the cause of the nagatum. One can get more cases by linking the effect of the opposed to the pervader of the negatum (*vyāpaka-viruddha-kārya-upalabdhih*) and so on. Probably, he stops at the eleventh case after indicating that such proliferation is possible and leaves it to be developed by the reader as it is to be expected in the Sanskrit tradition. He could have also moved the ninth case up and mentioned it with the first three and then introduce the logical operation of opposition and apply it to each of the first four to generate the next four and then move on to the cases listed as (5), (6) and (11).

The important point is that he has looked at all relevant basic cases and listed them methodically and also indicated briefly how one can generate more new cases. DK's *Nyāyabindu* is written in an aphoristic style. Given that style of writing it would have been a violation of the tradition for DK to get into more details that can be worked out with the help of a qualified teacher. Similarly, because of the importance of the oral tradition, it would have been violation of the tradition even for the commentators to get into full details that can be learnt with the help of a teacher. This is why Sanskrit logicians keep the discussion of formal operations to the minimum. For, unlike other materials, formal operations can be worked out on one's own by someone who understands them. It is clear that DK does not list anything formally invalid as a probans. For example, while he mentions nonperception of the pervader and apprehension of what is opposed to the pervader as cases of this kind of probans (that are formally valid) he does not mention nonperception of the pervaded (*vyāpta-anupalabdhih*) or apprehension of what is opposed to the pervaded (*vyāpta-viruddha-upalabdhih*) as cases of this kind of probans (that

are formally invalid). The omission of such formally invalid cases is not by accident. The fact that DK and his commentators systematically avoid formally invalid cases and confine themselves to only formally valid cases (that are also sound) suggests that they have a clear grasp of formal validity as well as soundness.

As we look at the eleven cases of nonperception as probantia for negative conclusions, we see that when two things are opposed or related as cause and effect or related by way of pervasion from the perception or nonperception of one there is negation of the other. When two things are opposed, from the perception of one there is negation of the other. Again, when two things are related as cause and effect, from nonperception of the effect there is negation of the unobstructed and capable cause or from nonperception of the unobstructed and capable cause there is negation of the effect. Further, when two things are related as the pervader and the pervaded, from nonperception of the pervader there is negation of the pervaded.[4]

(1) In the case of nonperception of its own presence there is the relation of the pervaded and the pervader (identity: *tadatmya*); nonperception of a thing (when all other conditions of perception are fulfilled) is pervaded by absence of that.
(2) In the case of nonperception of the effect there is causal connection between two things.
(3) In the case of nonperception of the pervader there is pervasion between two things.
(4) In the case of perception of what is opposed there is opposition between two things.
(5) In the case of perception of the effect of what is opposed there is indirect opposition and causal connection.
(6) In the case of perception of something pervaded by what is opposed there is opposition and pervasion.
(7) In the case of perception of what is opposed to the effect there is indirect causal connection and opposition.
(8) In the case of perception of what is opposed to the pervader there is indirect pervasion and opposition.
(9) In the case of nonperception of the cause there is causal connection between two things.
(10) In the case of something opposed to the cause there is indirect causal connection and opposition.
(11) In the case of perception of the effect of what is opposed to the cause there is indirect causal connection, opposition and again causal connection.

Without any doubt DK's study of nonperception contains great contributions to both inductive and deductive logic. The inclusion of nonperception in probans through identity and the inclusion of ten other kinds of nonperception in the first kind of nonperception show high levels of sophistication in both formal and informal logic.

However, DK's study of nonperception as a probans does not throw much new light on the problem of induction. The cases of the effect as a probans (*kārya-hetu*) may include empirical induction involving matters of fact if the cause and the effect are distinct events. But the problems arising out of DK's view of the effect as a probans have been mentioned earlier. So far as the cases of identity as a probans (*svabhāva-hetu* in which nonperception as a probans is included) are concerned it is unclear if they are about empirical induction involving matters of fact. A pervasion such as wherever the pervader is absent the pervaded too is absent may not be an empirical induction and, if not, is not of much relevance to the Carvaka-Humean critique of induction.

NOTES

1. A common example found in many different Indian philosophical schools of an inference with a general term as the inferential subject is the following. All originated things are non-eternal—for example, a pot. Sound is originated. Therefore, sound is non-eternal. In other words, all sounds are originated and are, therefore, non-eternal. While commenting on 2.32, Dharmottara cites the inference that sound is momentary. He makes it clear that the inference is not only about perceived sounds but also about unperceived sounds so that all sounds are included in the inferential subject.

2. For an example of a sound inference in early Nyāya where the conclusion is a particular proposition, see the *Nyāyasūtra*, Adhyāya 4. Gotama there argues that not everything is eternal, which implies that some things are not eternal.

3. See chapter IX of DI for more on identity and causation.

4. See Dharmakirti, *Nyāyabindu*, with the commentary *Manjarī* by Sanjit Kumar Sadhukhan, Sadesh, Kolkata, 2007, 262–65.

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